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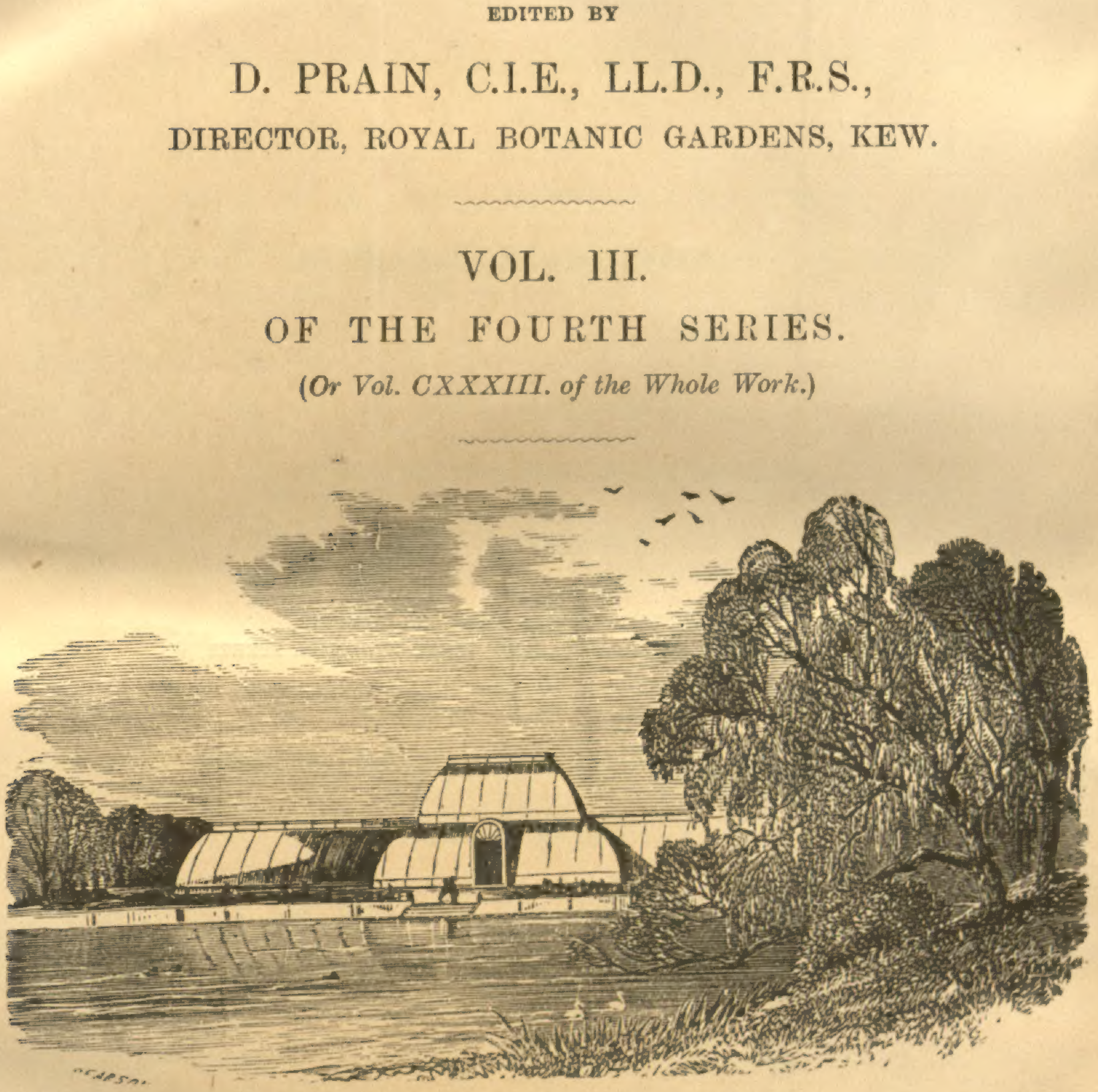

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Mo. Bot. Garden
1908

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Royal Botanic Gardens, Kew,
Dec. 1, 1907.

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Tab. 8112.

LOMATIA FERRUGINEA.

Chili and Patagonia.

PROTEACEAE. Tribe EMBOTHRIEAE.

LOMATIA, *R. Br.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 183.

Lomatia ferruginea, *R. Br. in Trans. Linn. Soc.* vol. x. p. 200; *Roem. et Schult. Syst.* vol. iii. p. 434; *Hook. f. Fl. Antarct.* p. 342; *Lindl. & Paxt. Fl. Gard.* vol. ii. p. 165; *C. Gay, Hist. de Chile, Bot.* vol. v. p. 310; *Meisner in DC. Prodr.* vol. xiv. p. 449; *Murillo, Plantes Méd. du Chili,* p. 195; species distincta, foliis bipinnatisectis vel tripinnatisectis primum dense ferrugineo-velutinis, racemis axillaribus brevibus latisque, alabastris valde inflatis.

Frutex 3–6 m. altus vel interdum arbor parva, valde ramosus, partibus junioribus dense ferrugineo-velutinis. *Folia* breviter petiolata, bipinnatisecta, apicem versus bipinnatipartita, patula, coriacea, oblongo-ovata, saepius circiter 2 dm. longa, interdum ad 4 dm. longa, 8 cm.—2 dm. lata, proventu fere glabrata; pinnae saepe oppositae, 5–15-jugae, oblongo-lanceolatae, generaliter 4–8 cm. longae, breviter stipitatae; laciniae ovato-lanceolatae, saepius alternae et decurrenti-confluentes, 1–2 cm. longae, revolutae, integerrimae vel lobis 1–6 plus minusve pungentibus praeditae. *Racemi* axillares, erecto-patentes, laxe multiflori, foliis multo breviores; pedicelli 4–6 mm. longi. *Flores* 1–1·3 cm. longi. *Calycis* segmenta extra aurea et coccinea, intra vivide coccinea, basi apiceque lutea, oblonga, 4·5 mm. lata, 3-nervia, extra ferrugineo-strigillosa. *Gynophorium* 1 cm. longum stylo paulum brevius. *Folliculus* oblongus, leviter arcuatus, 2·5–3 cm. longus, apice longe acuminatus. *Semina* apice ala oblonga oblique truncata instructa.—*L. pinnatifolia,* Hort.; Annesley, Beautiful and Rare Trees and Plants, p. 9, cum tabula. *Embothrium ferrugineum,* Cav. Ic. vol. iv. p. 59, t. 385. *Tricondylus ferrugineus,* Knight, Prot. p. 123.

This handsome *Lomatia* was one of the early introductions of Messrs. James Veitch & Sons, having been collected for them by William Lobb during his travels in Western South America in 1845-48. It has been recorded from several localities in Southern Chili, in the island of Chiloe and the Chonos Archipelago, growing, according to Cavanilles, in places occasionally inundated by the sea. Dr. R. O. Cunningham noted its occurrence far down the western coast of Patagonia, and Dr. R. W. Coppinger, during the voyage of H.M.S. "Alert," in 1878-82, collected a specimen at Sandy Point, on the east coast of the Brunswick Peninsula, in the Straits of Magellan. This point appears to be the eastern limit of its distribution.

The plant has some repute as a medicine among the

Indians of Chili. Gay informs us that a decoction of the wood and leaves, and especially of the bark, mixed with the Tayu, *Chuquiraga leucoxylon*, Poepp., is sometimes used in Valdivia in cases of abscess of the stomach. On the authority of Murillo, Chatterton and Pennesse state that the leaves and bark are employed as a cathartic and diuretic, and in the preparation of gargles for all kinds of inflammation of the throat.

Lomatia ferruginea is cultivated in the Temperate House at Kew, but the plant, now about 4 ft. high, has not flowered. The material figured was from a fine specimen growing in the beautiful gardens of the Earl Annesley at Castlewellan, Co. Down, Ireland, whence it was sent by Mr. T. Ryan in July, 1906. At Castlewellan, Earl Annesley informs us, "it is so hardy that the severest frost and the most biting east winds do not affect it. The plant is now about twenty years old, and is 9 ft. high, with a circumference of 27 ft. at the largest part."

Descr.—A much-branched shrub 10–20 ft. high, or sometimes a small tree, densely covered on the younger parts with a ferruginous velvet-like pubescence. *Leaves* shortly stalked, bipinnatisect, or sometimes tripinnatisect at the base, bipinnatipartite towards the apex, spreading, leathery, oblong-ovate, usually about 8 in. long, sometimes as much as 16 in. long, 4–8 in. broad, finally almost glabrous; pinnae in 5–15 pairs, oblong-lanceolate, usually $1\frac{3}{4}$–$3\frac{1}{3}$ in. long, shortly stalked; segments ovate-lanceolate, $\frac{1}{4}$–$\frac{3}{4}$ in. long, entire, or with 1–6 more or less spinescent lobes. *Flowers* about $\frac{1}{2}$ in. long, golden-yellow and scarlet outside, bright scarlet, with yellow at the base and apex of the segments inside, covered with ferruginous adpressed hairs outside. *Fruit* oblong, stalked, slightly curved, 1–$1\frac{1}{4}$ in. long, acuminate. *Seeds* with an oblong, obliquely truncate wing at the apex.—S. A. Skan.

Fig. 1, flower; 2, stamen attached to perianth-segment; 3, pistil; 4, section of ovary; 5, ovule:—*all enlarged*.

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Tab. 8113.

ACONITUM GYMNANDRUM.

Tibet and W. China.

Ranunculaceae. Tribe Helleboreae.

Aconitum, *L.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 9.

Aconitum gymnandrum, *Maxim. in Bull. Acad. Petersb.* xxiii. (1877), p. 308; *Flor. Tangut.* p. 26, tab. vi. figs. 1–6; *Stapf in Ann. Roy. Bot. Gard. Calcutta,* vol. x. part ii. (1905), p. 178; ab omnibus speciebus generis duratione annua et sepalis longe unguiculatis androecium exponentibus distincta, sectionem *Gymnaconitum,* Stapf, sistens.

Herba annua. *Radix* fusiformis, gracilis. *Caulis* simplex vel ramosus, erectus, ad 1 m. altus, magis minusve hirsutus. *Folia* sparsa, rarius in speciminibus nanis rosulata, petiolata, hirsuta; lamina ambitu reniformis vel ovata, 2–5 cm. longa, 2·5–6 cm. lata (vel in planta culta majora), ternata vel fere ad basin 3-partita divisionibus similiter divisis, laciniis inciso-dentatis. *Inflorescentia* racemosa vel subpaniculata, hirsuta, laxa vel densa; bracteae inferiores folia summa referentes, superiores redactae, summae integrae, lineari-lanceolatae; pedicelli erecti, infimi ad 6 cm. longi, vel omnes breves; bracteolae lanceolatae vel lineares, flori approximatae. *Sepala* violacea vel saturate coerulea, pilis longis albis molliter hirsuta; summum breviter galeatum vel subnaviculare, breviter rostratum, longe anguste unguiculatum, 2 ad ultra 2·5 cm. altum; lateralia abrupte in unguem linearem limbum aequantem vel subbreviorem contracta, limbo elliptico vel rotundato obtuso vel apiculato, 1·7–2 cm. longo ad 1·7 cm. poll. lato; inferiora lateralibus similia nisi minora. *Nectaria* glabra vel sparse pilosula, ungue erecto ultra 1·25 cm. longo, cuculla erecta vel suberecta dorso sub apice gibbosa, labio amplo rotundato denticulato patente. *Filamenta* longe persistentia, hispidula, ad vel ultra medium alata. *Carpella* ad 12, parallela, oblonga, abrupte in stylum contracta, villoso-hirsuta. *Folliculi* oblongi, truncati, fere 1·25 cm. longi, magis minusve glabrescentes, superne divergentes. *Semina* obpyramidata, nigrescentia, 1·25 cm. longa, transverse minute lamellata.

This peculiar Aconite was discovered by the great explorer of Central Asia, General N. M. Przewalski, in alpine meadows in the mountains to the north and east of Kuku-Nor. It has since been found in Eastern and Southern Tibet, and Western China. The specimen figured here was raised from seeds gathered at Gyantse by Capt. H. J. Walton during the expedition to Lhassa in September, 1904, and communicated by the Director of the Botanical Survey of India. It differs in general aspect considerably from all the other species of the genus in the long-clawed lateral sepals, the blades of which are twisted sideways, so as to show their brightly coloured inner faces, and expose

the androecium and gynoecium. The upper sepal (helmet) is, except for the coloured margin, herbaceous, and so narrow that in the fully open flower the large petaloid lips of the nectaries are outside, forming a roof over the androecium. The true position of the sepals and nectaries is not clearly seen in dried specimens, and is not properly shown in the figure of *A. gymnandrum* published in my monograph of the Indian Aconites.

Descr.—Annual; roots slender, fusiform. *Stem* erect, simple or branched, 6 in. to 3 ft. high, more or less hairy. *Leaves* petioled, hirsute, reniform to ovate, usually $\frac{3}{4}$–2 in. long, 1–1$\frac{1}{2}$ in. broad, ternate, or deeply tripartite, divisions similarly divided. *Inflorescence* racemose or subpaniculate, hirsute; lower bracts like upper leaves, reduced upwards; pedicels erect, lowest 2–3 in. long, or all short; bracteoles narrow, close to the flower. *Sepals* violet to deep blue, hairy; upper helmet-shaped, shortly beaked, claw narrow, $\frac{2}{3}$–1 in. long; lateral abruptly contracted into a slender claw, limb turned outwards, about $\frac{3}{4}$ in. long; lower like lateral, but smaller. *Nectaries* with a claw, erect, almost $\frac{1}{2}$ in. long; hood gibbous behind near top, with large, denticulate, petaloid lip. *Filaments* hispidulous, winged to the middle. *Follicles* usually 10–12, oblong, truncate, almost $\frac{1}{2}$ in. long, more or less glabrescent, at length slightly divergent above. *Seeds* inversely pyramidal, blackish, $\frac{1}{12}$ in. long, transversely minutely lamellate.—Otto Stapf.

Figs. 1 and 2, nectaries; 3, a stamen; 4, gynoecium:—*all enlarged.*

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Tab. 8114.

VIBURNUM Carlesii.

Corea.

Caprifoliaceae. Tribe Sambuceae.
Viburnum, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 3.

Viburnum (§ **Euviburnum**) **Carlesii**, *Hemsl. in Journ. Linn. Soc.* vol. xxiii. p. 350; *Bean in Gard. Chron.* 1906, vol. i. p. 306; species ex affinitate *V. cotinifolii*, a qua tamen foliis rotundato-ovatis cymis densioribus et corollae, tubo cylindrico longiore differt.

Frutex laxe ramosus, paucipedalis, stellato-tomentosus, ramis rectis rigidis glabrescentibus. *Folia* breviter petiolata, crassa, papyracea, rotundato-ovata vel interdum fere orbicularia 2·5–5 cm. diametro, crenato-dentata, supra parce subtus dense tomentosa, venis primariis elevatis in dentes excurrentibus. *Cymae* terminales, subsessiles, densissimae, 4–8 cm. diametro, umbellatae; bracteolae crassae, lineares, calycem aequantes. *Calycis dentes* ovati, erecti, obtusi, obscure puberuli. *Corolla* glabra, hypocraterimorpha, albo-rubra, tubus cylindricus, 1–1·3 cm. longus; lobi rotundati, circiter 1 cm. diametro. *Stamina* inclusa. *Stylus* brevissimus, crassus, stigmate capitato. *Fructus*, immaturus tantum visus, glaber, valde compressus, sulcatus, calycis limbo aucto coronatus.

Viburnum Carlesii was originally described from dried specimens collected by Mr. W. R. Carles, C.M.G., and Mr. Wykeham Perry in Western Corea. In 1801 Messrs. L. Boehmer & Co., nurserymen at Yokohama, Japan, sent a cultivated specimen to Kew to be named, with the information that it had been raised from seed obtained from Corea in 1885. A living plant was received from the same firm in 1902, and this flowered in the Arboretum in May, 1906. *Le Jardin* for August, 1902, p. 229, reproduces a photograph of a cluster of flowering branches received from a Mr. T. Eckhardt, also of Yokohama. The original description is also repeated, and the remarks:—"In foliage and general appearance this species closely resembles the Indian *V. cotinifolium*, from which it is readily distinguished by the strictly cylindrical tube of the corolla," have been incorrectly translated:—"En feuillage et apparènce générale, cette espèce ressemble beaucoup à l'indien *V. cotinifolium*, duquel il se distingue seulement par la position strictement erigée du tube de sa corolle." The same photograph was reproduced in the *Gardeners' Chronicle*, October 11th, 1892.

January 1st, 1907.

This shrub is quite hardy at Kew, blossoming as quite a small plant, and it is likely to become a general favourite. It is easily propagated from cuttings. The pink and white, very fragrant flowers remind one of *Rondeletia versicolor*.

Descr.—A dwarf, loosely branched shrub, clothed with stellate hairs. *Branches* straight, stiff, glabrescent. *Leaves* shortly stalked, thick, soft, densely hairy beneath, ovate-rotundate or almost orbicular, 1–2 in. in diameter, crenate-dentate; primary veins prominent, running out into the teeth. *Cymes* terminal, almost sessile, very dense, 2–3 in. in diameter; bracteoles linear, thick, nearly equalling the calyx. *Calyx-lobes* ovate, erect, obtuse, slightly puberulous. *Corolla* pink and white, smooth, salver-shaped; tube cylindrical, about $\frac{1}{2}$ in. long; lobes rounded, about $\frac{1}{3}$ in. in diameter. *Stamens* included in the corolla. *Fruit* smooth, compressed, furrowed, surmounted by the enlarged calyx-lobes.—W. Botting Hemsley.

Fig. 1, portion of leaf; 2, stellate hair from the upper surface of the same; 3, pair of flowers; 4, hair from the under surface of a leaf; 5 and 6, stamens; 7, pistil:—*all enlarged*.

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T. dependens does not occur, to *Eugenia planipes*, Hook. et Arn. The wood of *E. planipes* is of no use except for charcoal, and Gay states that supplies of it have at times been ordered by merchants, who were misled by its bearing the same native name as *T. dependens*.

T. lanceolata was introduced in 1848 by William Lobb for Messrs. J. Veitch & Sons, and was successively reintroduced for the same firm by Pearce and Downton (see *The Garden*, November 27th, 1880). It flourishes out of doors in Cornwall, the south of Ireland, and the west of Scotland, and a specimen 18 ft. high was noticed by Mr. W. Watson during a recent visit to Ireland. The maximum height given by Reiche for *T. lanceolata* in Chili is 5 metres. Mr. Watson has observed that wasps rob *T. lanceolata* of its honey by biting a hole at the base of the corolla.

The introduction of *T. dependens* is due to Mr. H. J. Elwes, F.R.S., who brought back seeds of it from Chili in 1902. It is of rapid growth, and one of the specimens in the Temperate House at Kew has already attained a height of about 10 ft. *T. dependens* may be readily propagated by cuttings. The flowering branch figured was from a cutting of the original plant.

Descr.—A small, compact tree, attaining a height of 20–30 ft. in its native country. *Branches* very numerous, rather spreading; young branchlets reddish. *Leaves* obovate or elliptic, more rarely ovate, $\frac{3}{4}$–$2\frac{1}{2}$ in. long, $\frac{1}{2}$–$1\frac{1}{4}$ in. broad, obtuse or rounded at the apex, serrate, thinly coriaceous. *Flowers* 1–3 together in the axils, borne on long curved peduncles. *Calyx* cup-shaped, with five small teeth, soon splitting and falling off, or remaining as a loose ring round the peduncle. *Petals* oblong, 3-toothed at the apex, about $\frac{3}{4}$ in. long, white. *Stamens* 15–18. *Ovary* 3–4-celled; style subulate.—T. A. Sprague.

Fig. 1, a flower with petals removed; 2, petal; 3, anther:—*all enlarged.*

M.S. del. J.N. Fitch lith.

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Tab. 8116.

RENANTHERA annamensis.

Annam.

Orchidaceae. Tribe Vandeae.

Renanthera, *Lour.*: *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 577.

Renanthera annamensis, *Rolfe*, a *R. Imschootiana*, Rolfe, floribus duplo minoribus et sepalis maculatis distincta.

Herba epiphytica, erecta vel subscandens, radicans, 20–30 cm. alta. *Radices* crassae. *Folia* disticha, patentia, circa 2 cm. distantia, oblonga, obtusa et inaequaliter biloba, crasse coriacea, 5–7 cm. longa, 1·5–1·8 cm. lata. *Racemi* interdum ramosi, circa 20–25 cm. longi, multiflori. *Bracteae* ovato-oblongae, obtusae, 2 mm. longae. *Pedicelli* 1 cm. longi. *Sepalum* posticum anguste oblongum, obtusum, concavum, circa 1·3 cm. longum, 3·5 mm. latum; sepala lateralia spathulata, subobtusa, 1·8 cm. longa, 6 mm. lata. *Petala* anguste oblonga, obtusa, subconcava, 7 mm. longa, 2 mm. lata. *Labellum* trilobum, 6 mm. longum; lobi laterales erecti, triangulares, acuti, carnosi, 2 mm. longi; lobus intermedius patens, cordato-orbicularis, obtusus, 3·5 mm. latus, basi quinque-callosus; calcar saccatum, oblongum, obtusum, 4 mm. longum. *Columna* lata, 3 mm. longa.

Renanthera is a small Malayan genus of about ten or twelve known species, closely allied to *Vanda*, and remarkable for the brilliancy of their flowers. It was established in 1790, by Loureiro, the original species being the handsome *R. coccinea*, a tall climber, bearing panicles of brilliant scarlet flowers, which is a great favourite with the natives of Southern China, where it has been cultivated from time immemorial. It first flowered in England in 1827, at Claremont, after having been in cultivation for ten years or more, and three years later it was figured in the Magazine (t. 2997-8). Two other species have also been figured here, namely, *R. Storiei*, Reichb. f. (t. 7537), a native of the Philippines, less scandent in habit, and having larger crimson flowers, blotched with purple on the lateral sepals, and *R. Imschootiana*, Rolfe (t. 7711), a dwarf Burmese species, which has the merit of flowering when about a foot high.

R. annamensis, Rolfe, is much like the last-named species in habit, and indeed was taken for it until it bloomed, when the marked differences in the size and colour of the flowers at once proved that it is distinct. It was discovered in Annam by Mr. W. Micholitz, a

collector for Messrs. Sander & Sons, and flowered at Kew in May, 1906, under tropical treatment.

Descr.—A dwarf, erect epiphyte, 8–12 in. high, bearing a few stout roots on the stem. *Leaves* in two ranks, spreading, nearly $\frac{1}{2}$ in. apart, oblong, obtuse and unequally 2-lobed at the apex, thick and leathery, 2–3 in. long, rather over $\frac{1}{2}$ in. broad. *Racemes* sometimes branched, 8–10 in. long, many-flowered. *Bracts* ovate-oblong, obtuse, about $1\frac{1}{2}$ in. long. *Flowers* yellow, spotted with crimson on the sepals, spur and lower part of the petals; lobes of the lip and apex of the petals deep crimson. *Upper sepal* narrowly oblong, obtuse, concave, $\frac{1}{2}$ in. long; lateral sepals spathulate, somewhat obtuse and concave, $\frac{3}{4}$ in. long, $\frac{1}{4}$ in. broad. *Petals* narrowly oblong, obtuse and somewhat concave, $\frac{1}{4}$ in. long. *Lip* 3-lobed, $\frac{1}{4}$ in. long; side lobes erect, triangular, acute, fleshy; front lobe spreading, cordate-orbicular, obtuse, with 5 fleshy calli at the base; sac oblong, obtuse, $\frac{1}{6}$ in. long. *Column* broad, much shorter than the lip.—R. A. Rolfe.

Fig. 1, lip and column; 2, posterior part of lip; 3, anther cap; 4 and 5, pollen masses:—*all enlarged.*

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Tab. 8117.

NERINE Bowdeni.

Cape Colony.

Amaryllidaceae. Tribe Amarylleae.

Nerine, *Herb.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 728; *Baker in Gard. Chron.* 1885, vol. xxiv. p. 779, & *Handb. Amaryll.* p. 99.

Nerine Bowdeni, *W. Watson in Gard. Chron.* 1904, vol. xxxvi. n. 365; *Flora & Sylva*, 1905, p. 120, cum icone colorata; *N. lucidae*, Herb., affinis, floribus majoribus pedicellis longioribus perianthiique segmentis latioribus differt.

Bulbus tunicatus, affatim pullulascens, magnitudine sat variabilis; bulbi maiores corpore ovoidei 5 cm. longi, 4 cm. crassi, sensim in collum 2 cm. crassum, 5 cm. longum abeuntes; lamellae extimae tenuiores, lucidae, brunnescentes. *Folia* laete viridia, laevia, decidua, supra aliquando canaliculata, 15–30 cm. longa, medio 1·25–2·5 cm. lata, hinc apicem obtusum basem que vaginatam versus attenuata. *Scapus* cylindraceus, fistulosus, pennâ cygneâ crassus, 30–45 cm. altus. *Spathae* 2, scariosae, primo viridis, demum punicantes, 5 cm. longae. *Flores* terminales pedicellati in fasciculos subumbelliformes 6–12-floros, 20–22 cm. latos aggregati, exteriores caeteris citius aperti; pedicelli trigoni, pennâ gallinaceâ crassi, 5 cm. longi, umbrino-virides. *Perianthii segmenta* 6, conformia, refracto-patentia, margine parum undulata, 5–7·5 cm. longa, 1·25 cm. lata, carina centrali suffuse rosea ceterum pallidiora. *Stamina* segmentis perianthii aequilonga; filamenta pallide punicea declinata apicem versus tamen sursum spectantia; antherae brunnescentes oblongae, 1 cm. longae; pollen viride. *Ovarium* subglobosum, 3-lobum, 6 cm. longum, extus viride, nitidum; stylus pallide roseus, more filamentorum curvatus hisque aequilongus; stigma parum capitatum.—*N. excellens major tardiflora*, Gumbleton in Gard. Chron. 1904, vol. xxxv. p. 105. *N. lucida*, Hackett in Gard Chron. 1904, vol. xxxvi. p. 346, non Herb.—D. Prain.

This is one of several species which might almost be called connecting links between *Nerine* and *Brunsvigia*, the others being *N. lucida* which Herbert included in *Brunsvigia*, and *N. marginata*, Ait. The difference between the two genera is chiefly one of size, the shape of the capsule—turbinate and acutely angled in *Brunsvigia*, globose and obtusely angled in *Nerine*—amounting to very little, as *B. Sclateriana* has a typical *Nerine* capsule. Whether they will intercross does not appear to have been tested, although all the Nerines cross readily with each other, as was proved long ago by Herbert, who paid especial attention to them, and more recently by Mr. J. O'Brien, Mr. Max Leichtlin, Mr. Elwes

and others. The genus bids fair to become as popular in gardens as the Hippeastrums, most of the species growing well under cultivation and flowering freely towards the end of the year, when their bright-coloured, elegant flowers are especially valuable. As is the case with many bulbous plants from South Africa, the Nerines are in active growth in winter, ripening in May or June, and resting till October, when they push up their flower-scapes, generally before the new leaves appear.

For the introduction of *N. Bowdeni* we are indebted to Mrs. Cornish Bowden, of Oaklawn, Newton Abbot, who received it from her son in South Africa, and presented several bulbs to Kew in 1903. She wrote :—"Some years since my son Athelstan sent me some bulbs of a *Nerine* from Cape Colony. I have flowered them for three years, and they are very beautiful. Unlike the majority of Nerines, this never has a dormant stage, the leaves remaining green until the flowers are well in bloom. I have one spike with twelve flowers upon it." Shortly afterwards Mr. Gumbleton flowered it, the inflorescence here figured having been forwarded to Kew by him (see *Gardener's Chronicle*, 1904, vol. xxxv. p. 105; it also flowered in the nursery of Messrs. R. Veitch & Sons at Exeter. The Kew plants have flowered annually in November, but they have from the first lost their leaves after making their growth, as do all the Nerines and Brunsvigias.

Descr.—Bulbs varying in size, producing offsets freely, the largest being bottle-shaped, the swollen portion ovoid, 2 in long and $1\frac{1}{2}$ in. in diameter; the neck narrow and 2 in. long, the outer tunic thin, smooth, shining, pale brown. *Leaves* 6 in. to a foot long, $\frac{1}{2}$ to 1 in. broad in the middle, gradually narrowing downwards and to the obtuse apex, slightly channelled, glossy green, deciduous. *Scape* nearly cylindrical, hollow, thick as a swan's quill, 12 to 18 in. long. *Spathes* scarious, about 2 in. long, green, changing to pink with age. *Umbel* loose, 9 in. across, composed of from 6 to 12 centripetal flowers; pedicels trigonous, 2 in. long, green tinged with brown, stouter than in other Nerines. *Ovary* sub-globose, 3-lobed, polished green. *Perianth* subhorizontal, composed of six spreading recurved segments 2 to 3 in. long, $\frac{1}{2}$ in. wide, slightly wavy in the recurved portion, rose pink, the

keel a darker shade, giving the flowers a streaked appearance. *Stamens* declinate, as long as the segments, upcurved at the tips; anthers oblong, $\frac{1}{3}$ in. long. *Style* as long as the anthers, stigma capitate.—W. Watson.

Figs. 1 and 2, stamens; 3, style:—*enlarged*; 4, whole plant, *about* $\frac{1}{3}$ *natural size*.

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Tab. 8118.

OLEARIA speciosa.

Australia.

Compositae. Tribe Asteroideae.

Olearia, *Moench*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 276.

Olearia speciosa, *Hutchinson*; affinis *O. dentatae*, Moench, a qua foliis oblongo-ellipticis floribus paucioribus et achaenis fere glabris differt.

Frutex divaricatus, circiter 1 m. altus, ramis teretibus dense tomentosis. *Folia* alterna, petiolata, coriacea, oblongo-elliptica, 4–6 cm. longa, 2–3 cm. lata, supra costa pubescenti excepta glabra, subtus dense tomentosa, marginibus recurva denticulata, dentibus 5 mm. distantibus; venae anastomosantes prominulaeque; petiolus 8 mm. longus. *Capitula* corymbos laxos terminales formantia, oblonga, 1·7 cm. longa, 2·5 cm. diametro; pedunculi usque ad 7·5 cm. longi; bracteae oblongae, dense tomentosae. *Involucri bracteae* oblongae, extra tomentosae, intra glabrae. *Flores radii* 5–6; ligulae albae, oblongo-ellipticae, 12 mm. longae, 6 mm. latae. *Flores disci* 10–12; corollae tubus 6 mm. longus; antherae apiculatae, 4 mm. longae. *Achaenia* teretia, fere glabra, 4 mm. longa. *Pappi setae* numerosae, breviter pilosae.

The genus *Olearia* is closely allied to *Aster*, and is confined exclusively to Australasia. Cheeseman, in his recent *Manual of the Flora of New Zealand*, enumerates 35 species, all of which are endemic. There are about 70 others, which are confined to Australia and Tasmania, with the exception of two recorded from Lord Howe's Island.

The plant here figured was raised from seeds received in 1888 from the Botanic Gardens, Melbourne, and since increased by cuttings. It flowered last May in the Temperate House at Kew, where it forms a straggling bush about 3 ft. high. Its affinity is with *O. dentata*, Moench, from which it differs in having fewer ray-florets, which are white, and almost glabrous achenes. The thick coriaceous leaves are also very distinct.

The genus furnishes a number of excellent plants for the cool greenhouse, and some of the more hardy species make fine bushes in the open border. Amongst the latter *O. Haastii*, Hook. f., is probably the best known, and it succeeds in almost any kind of soil.

Descr.—A straggling shrub about 3 ft. high, with terete, densely tomentose branches. *Leaves* alternate, petioled,

coriaceous, oblong-elliptic, $1\frac{1}{2}$–$2\frac{1}{2}$ in. long, $\frac{3}{4}$–$1\frac{1}{4}$ in. broad, glabrous above, except the pubescent midrib, densely tomentose below, with recurved, denticulate margins; veins closely anastomosing and prominent; petiole $\frac{1}{3}$ in. long. *Capitula* arranged in lax, terminal corymbs, oblong, $\frac{2}{3}$ in. long, 1 in. in diameter; peduncles usually 2–3 in. long; bracts oblong, densely tomentose. *Involucral bracts* oblong, tomentose outside, glabrous within. *Ray-flowers* 5–6; ligules white, oblong-elliptic, $\frac{1}{2}$ in. long, $\frac{1}{4}$ in. broad. *Disk-flowers* 10–12; corolla $\frac{1}{4}$ in. long; anthers apiculate, $\frac{1}{8}$ in. long. *Achenes* terete, almost glabrous, $\frac{1}{6}$ in. long. *Seta* of the *pappus* numerous, shortly pilose.—J. Hutchinson.

Figs. 1 and 2, bracts; 3, ray-floret; 4, disk-floret; 5, pappus; 6, anthers; 7, style-arms:—*all enlarged.*

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Tab. 8119.

MECONOPSIS punicea.

Tibet and W. China.

Papaveraceae. Tribe Eupapavereae.

Meconopsis, *Vig*; *Benth. et Hook. f. Gen Plant.* vol. i p. 52; *Prantl & Kündig in Engl. & Prantl Pflanzenfam.* vol. iii. part 2, p. 141.

Meconopsis (§ Polychaetia) **punicea,** *Maxim. Flor. Tangut.* p. 34, t. 23, figs. 12–21; *Gard. Chron.* 1904, vol. xxxvi. pp. 282, 289, fig. 130; *Prain in Ann. Bot* vol. xx. p. 355; species in genere ob flores intense puniceos insignis, caeterisque exceptis *M. integrifolia* et *M. Oliveriana* tantum, quibus flores ambabus sunt lutei, stigmate sessili discrepat.

Herba monocarpica, acaulis. *Folia* radicalia caespitosa, pilis barbellatis laxe hirsuta, ovato-lanceolata, apice acuta, margine integra, basi sensim in petiolum latiusculum attenuata, 18–30 cm. longa, 4–5 cm. lata, utrinque viridia. *Flores* magni, speciosi, alabastrisque nutantes, pedunculis 1-floris simplicibus 45–50 cm. altis pilis subretrorsis indutis. *Sepala* 2, oblongo-ovata, 3 cm. longa, extra hirsuta. *Petala* 4, rarissime in cultis staminum impendio 8–9, ovato-oblonga, intense punicea, 10 cm. longa, 6 cm. lata. *Stamina* ∞, pluri-seriata, filamentis liguliformibus glabris discretis. *Ovarium* e carpellis 4–6 compositum, dense appresse hirsutum, ovatum, 2 cm. longum, stigmate sessili 4–6-lobo, lobis divaricatis radiantibus coronatum; placentae intrusae; ovula plurima. *Capsula* ovata, 2·5 cm. longa, 1·25 cm. lata; semina reticulata.

The Poppyworts which compose the genus *Meconopsis* are familiar and favourite plants in Alpine gardens. The genus is now known to include about twenty-seven distinguishable forms, of which seventeen have been introduced at various times to European horticulture; about twelve of these are now familiar to English growers. With the exception of *M. cambrica*, which is European, and two forms, possibly not specifically distinct, from California, the species of this genus are confined to the Himalayan range, to Western China, and to the eastern half of the Tibetan table-land. The following have already been figured in the Botanical Magazine:—*M. Wallichii*, t. 4668; *M. aculeata*, t. 5456; *M. robusta*, under the name *M. nipalensis*, t. 5585; *M. napaulensis*, as *M. Wallichii*, var. *rubrofusca*, t. 6760; *M. heterophylla*, t. 7636; and *M. integrifolia*, t. 8027.

Meconopsis punicea is unlike any species hitherto reported as regards the colour of its petals. In the majority of the species this is either yellow or blue, a few have

purple or red or orange flowers. *M. punicea* is the only species, so far known, in which the flowers after expansion remain pendulous. It further differs from the other known species, except *M. integrifolia* and *M. Oliveriana*, both of which have yellow petals, in the absence of a style. The divaricately radiating stigmatic lobes are characteristic of the group *Grandes*, of which *M. punicea* is a member.

Meconopsis punicea was first collected in Northern Tibet in 1884 by the late General Przewalski; it was obtained again in Northern Szechuen, in 1885, by Mr. G. N. Potanin. More recently it has been met with by Mr. E. H. Wilson, who gathered it in September, 1903, in grasslands about Sungpen, in Western China, at from 11,000–14,500 ft. above sea-level. Plants were raised by Messrs. James Veitch & Sons from seed communicated by Mr. Wilson. The plant figured, which flowered in the Rock Garden at Kew in June, 1906, was raised from seeds presented to Kew by Messrs. Veitch & Sons. This species is a biennial, flowering in the second year from seed, the crown of leaves dying down during the winter that precedes flowering. It thrives best in moist soil in a shaded situation, and ripens its seeds under cultivation.

Descr.—A monocarpic herb. *Stem* 0. *Leaves* tufted, radical, sparsely hairy, ovate-lanceolate, apex acute, margin entire, tapering gradually into a rather broad petiole, 7–12 in. long, 1½–2 in. wide, green above and below. *Flowers* large, striking, remaining pendulous after they open; peduncles slender, simple, 1-flowered, beset with spreading or reflexed hairs, 16–20 in. long. *Sepals* 2, oblong-ovate, 1¼ in. long, hirsute externally. *Petals* normally 4, occasionally in cultivation the outer stamens replaced by 4–5 additional petals, very dark pink, 4 in. long, 2¼ in. across, ovate-oblong. *Stamens* indefinite, several-seriate, the outer series sometimes replaced by additional petals, filaments flattened, glabrous, free. *Ovary* of 4–6 carpels, densely adpressed-hirsute, ovate, ¾ in. long; stigma sessile, 4–6-lobed, the lobes divaricate and radiating; placentas intruded; ovules numerous. *Capsule* ovate when ripe, 1 in. long, ½ in. wide; seeds with reticulated testa.—D. Prain.

Figs. 1 and 2, stamens; 3, pistil, *enlarged*; 4, an entire plant, *about one-sixth natural size.*

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Tab. 8120.

RIBES mogollonicum.

South-Western United States.

Saxifragaceae. Tribe Ribesieae.

Ribes, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 654.

Ribes (§ Ribesia) mogollonicum, *Greene in Bull. Torrey Bot. Club*, vol. viii. p. 121; species distincta *R. nevadensi*, Kellogg, proxima, sed racemis strictis suberectis, calycis viridescenti-albescentis tubo et segmentis brevioribus, petalis late obovatis brevioribus differt.

Frutex robustus, omnino inermis, e basi ramosus; rami 1·5–3 m. alti, ut ramuli erecti vel ascendentes, novellis minute puberulis. *Folia* late 5- (rarius 3-) lobata, suborbicularia, 2·5–7 cm. diam., basi cordata, basi juxta venas parcissime pilosa, glandulis sessilibus conspersa; lobi late ovati vel triangulares, crenato- vel bicrenato-serrati; petioli 2–4 cm. longi, dense minuteque puberuli. *Racemi* solitarii, ab apice ramulorum brevissimorum foliatorum orti, stricti, erecti vel erecto-patentes, glandulis stipitatis praediti, multi- et confertiflori, 1·5–3 cm. longi; pedunculi 2·5–3 cm. longi; bracteae elliptico-oblongae vel oblongo-spathulatae, 3–4 mm. longae, margine translucidae; pedicelli 1·5–4 mm. longi. *Calycis* viridescenti-albescentis tubus 1–1·5 mm. longus; segmenta oblonga, 3 mm. longa, circiter 2 mm. lata, paulum patentia, obtusa, conspicue paucivenosa. *Petala* alba, late obovato-spathulata vel rhomboideo-obovata, 1·5 mm. longa. *Stamina* petalis paulo longiora. *Ovarium* glandulis pallide luteis breviter stipitatis dense vestitum. *Stylus* 1·5–2·5 mm. longus, ad medium bifidus. *Bacca* purpureo-nigrescens, ovoideo-globosa, circiter 7 mm. diam., glandulis stipitatis parce instructa, edulis.—*R. Wolfii*, Rothrock in American Naturalist, vol. viii. p. 358, partim.

There is no question as to the identity of our plant with *R. mogollonicum*, but there are difficulties in the way of using this name for it. Mrs. Brandegee in *Zoe*, vol. iv. p. 88, appears to have been the first to point out that this species is the same as *R. Wolfii*, Rothrock. Reference to the description, however, was not convincing. In a number of points it is not applicable to *R. mogollonicum*, especially in the red sepals and petals, and the shape of the latter. These discrepancies may be explained by Prof. Coville's remarks in the *Proceedings of the Biological Society of Washington*, vol. xiv. p. 1. He discovered that the type sheet of *R. Wolfii* preserved in the National Herbarium, Washington, consisted of specimens of two distinct species, one represented by flowering specimens which Coville proposed to regard as the type of *R. Wolfii*, the other by fruiting specimens, which belong to *R. coloradense*, Coville.

February 1st, 1907.

But Rothrock, when he drew up his description, also had a third plant in mind, for he cites as a synonym of *R. Wolfii* the *R. sanguineum* var. *variegatum* of S. Watson in *King's Report of the Geological Exploration of the Fortieth Parallel*, vol. v. p. 100, which most authorities consider to be specifically distinct from *R. sanguineum*. In the *Botany of California*, vol. i. p. 207, Watson adhered to his name, and reduced Rothrock's species. A search in the Kew Herbarium brought to light the apparent identity of Watson's plant with *R. nevadense*, Kellogg in the *Proceedings of the California Academy of Natural Sciences*, vol. i. (1855), p. 63, ed. 2 (1873), p. 65, and this view is supported by Greene in his *Flora Franciscana*, p. 198, where he cites *R. sanguineum* var. *variegatum*, S. Wats., as synonymous with Kellogg's species, but he implies that Watson's name covers more than one plant, for he adds "partly." We are satisfied that *R. mogollonicum*, Greene, is the same as *R. Wolfii*, Rothrock, as emended and restricted by Coville, but we are doubtful as to the advisability of rejecting a name now introduced into gardens, and about which there is no uncertainty, for one which has led to so much confusion.

The plant from which the accompanying figure was prepared was raised from seed received from Mr. H. Henkel, of Darmstadt, in 1900. It is now about 2 ft. high. Another plant, obtained from the Missouri Botanical Garden in 1902, is 4½ ft. high. It flowers in May.

In habit *R. mogollonicum* closely resembles *R. sanguineum*, Pursh, and has similar large pink winter-buds. It has the odour of the Black Currant (*R. nigrum*, Linn.). The species is a native of the Mogollon Mountains in New Mexico, and of several localities in Colorado and Utah.

Descr.—A robust, unarmed shrub, branched from the base; branches reaching a height of 10 ft., like the branchlets erect or ascending, minutely puberulous on the youngest parts. *Leaves* 5- more rarely 3-lobed, suborbicular, 1–3 in. across, cordate at the base, sparingly pilose on the under side, and sprinkled with sessile glands; lobes broadly ovate or triangular, crenate-serrate or bicrenate-serrate; petioles ¾–1¾ in. long. *Racemes* solitary, arising at the apex of very short leafy branchlets, straight, erect, or erect-spreading, sprinkled with stalked glands, many-

and dense-flowered, $\frac{2}{3}$–$1\frac{1}{4}$ in. long; peduncles 1–$1\frac{1}{4}$ in. long; bracts elliptic-oblong or oblong-spathulate, $\frac{1}{10}$–$\frac{1}{6}$ in. long; pedicels $\frac{1}{6}$ in. long. *Calyx* greenish-white; tube about $\frac{1}{12}$ in. long; segments $\frac{1}{10}$ in. long, about $\frac{1}{12}$ in. broad, somewhat spreading, obtuse, conspicuously few-veined. *Petals* white, broadly obovate-spathulate or rhomboid-obovate, scarcely half as long as the calyx-segments. *Ovary* densely covered with shortly stalked pale yellow glands. *Berry* purplish- or bluish-black, ovoid-globose, about $\frac{1}{3}$ in. across, edible, sparingly furnished with stalked glands.—S. A. Skan.

Fig. 1, flower, with bract attached to the base of the pedicel; 2 and 3, stamens; 4, portion of the epidermis of the ovary with gland-tipped hairs; 5, seeds:—*all enlarged.*

M.S. del. J.N. Fitch lith.

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Tab. 8121.

SACCOLABIUM RUBESCENS.

Annam.

Orchidaceae. Tribe Vandeae.

Saccolabium, *Blume*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 578.

Saccolabium rubescens, *Rolfe in Kew Bulletin,* 1906, p. 114; *Orch. Rev.* 1906, p. 220; a *S. ampullaceo*, Lindl., caule altiore, foliis latioribus et subrecurvis, racemis pedunculatis, sepalis petalisque multo minoribus differt.

Caulis erectus, robustus, circa 25 cm. altus. *Folia* patentia vel recurva, coriacea, oblonga, inaequaliter et brevissime biloba, 12–15 cm. longa, 2·5–3·2 cm. lata. *Scapi* suberecti, 15–17 cm. longi. *Racemi* 7·5–10 cm. longi, multiflori. *Bracteae* ovatae, obtusae, concavae, 1 mm. longae. *Pedicelli* 1·8–2 cm. longi. *Sepalum* posticum late ellipticum, obtusum, vix 4 mm. longum; sepala lateralia ovata, quam posticum latiora. *Petala* late elliptica, obtusa, vix 4 mm. longa. *Labellum* trilobum; lobi laterales transverse oblongi, obtusissimi, incurvi, breves; lobus intermedius ovato-oblongus, subacutus, basi patens, apice incurvus, 1 mm. longus; calcar strictum vel subincurvum, 1 cm. longum. *Columna* brevissima.

Saccolabium rubescens, Rolfe, is one of the numerous novelties discovered in Annam by Mr. W. Micholitz, when collecting there for Messrs. Sander & Sons, in 1903. It is allied to the North Indian *S. ampullaceum*, Lindl., but is more robust in habit, and has much smaller flowers. The plant figured came from the importers, and flowered at Kew under tropical treatment in March, 1905. Shortly afterwards it flowered in the Royal Botanic Gardens, Glasnevin.

The genus is a large and polymorphic one, widely diffused in tropical Asia, where it practically replaces the African genus *Angraecum*, for though usually so different in the colour of the flowers, they are structurally very similar, and one or two African species have been described under both genera. Eleven species have already been figured in this work, and those which are nearly allied to the present one are *S. ampullaceum*, Lindl. (t. 5595), from N. India, *S. Hendersonianum*, Reichb. f. (t. 6222) from Borneo, *S. miniatum*, Lindl. (t. 5326), from Java, and *S. Mooreanum*, Rolfe (t. 7428), supposed to be from Sumatra. *S. Huttoni*, Hort. (t. 5681), is now referred to *Aërides*.

February 1st, 1907.

Descr.—An erect epiphyte, nearly a foot high. *Leaves* distichous, spreading or recurved, coriaceous, oblong, very shortly and unequally bilobed, 5–6 in. long, 1–1¼ in. broad. *Scapes* nearly erect, 6–7 in. high; racemes 3–5 in. long, many-flowered. *Bracts* ovate, obtuse, concave, scarcely $\frac{1}{20}$ in. long. *Pedicels* ¾ in. long. *Flowers* ¾ in. long, light rose-purple. *Dorsal* sepal broadly elliptical, obtuse, ⅙ in. long; lateral sepals ovate, broader than the dorsal. *Petals* broadly elliptical, obtuse, ⅙ in. long. *Lip* 3-lobed; side lobes transversely oblong, very obtuse, incurved, short; front lobe ovate-oblong, subacute, spreading at the base, incurved at the apex, $\frac{1}{20}$ in. long; spur straight or slightly curved, obtuse, under ½ in. long. *Column* very short.—R. A. Rolfe.

Fig. 1, flower; 2, column; 3 and 4, pollinarium, seen from front and back:—*all enlarged.*

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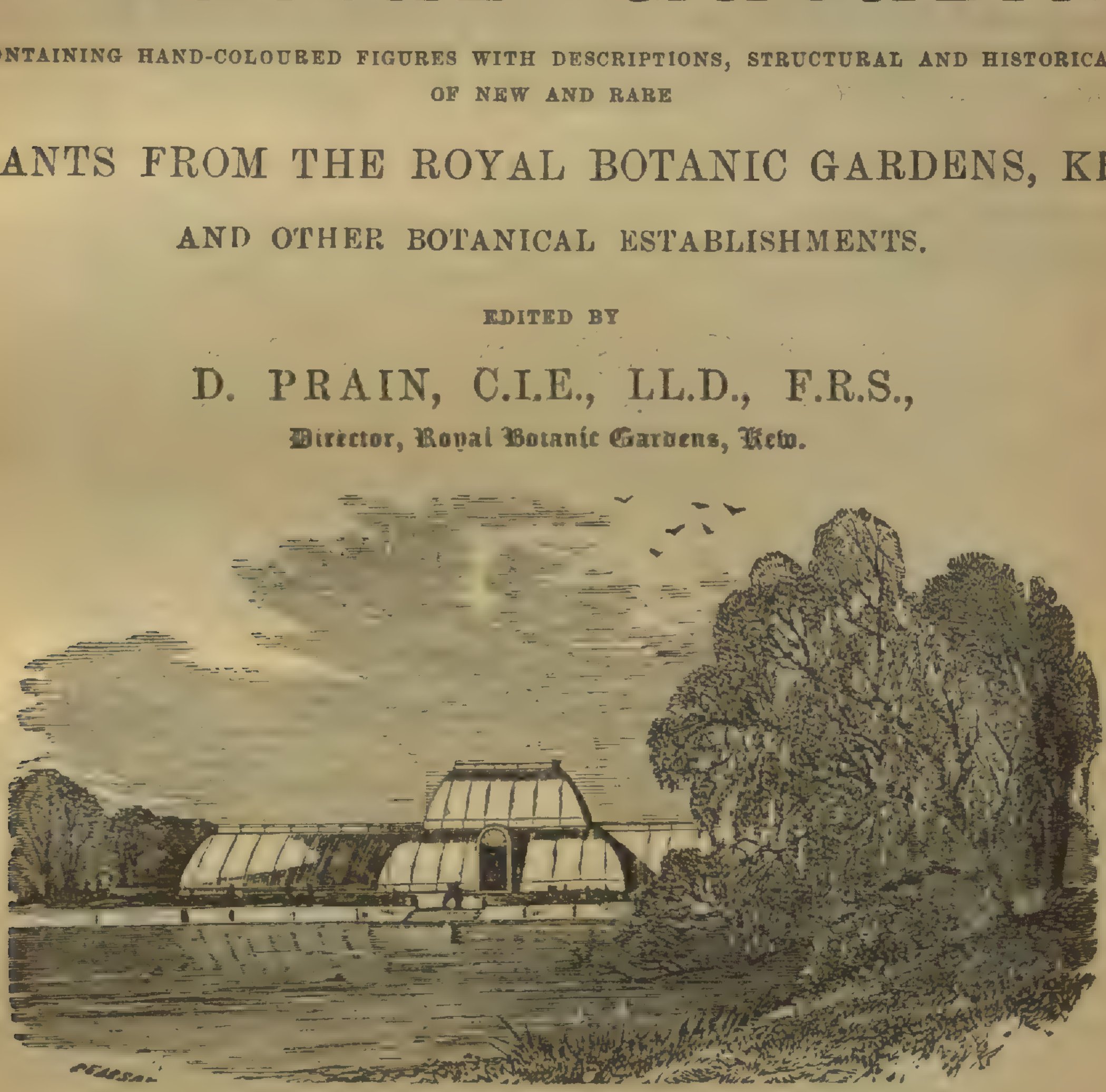

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Tab. 8122.

ALOË pallidiflora.

South Africa?

Liliaceae. Tribe Aloineae.

Aloe, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 776.

Aloe pallidiflora, *A. Berger in Engl. Bot. Jahrb.* vol. xxxvi. p. 58; *A. macracanthae,* Baker (B. M. t. 6580), affinis, foliorum spinis marginalibus inter se propioribus, perianthioque extus concolore differt.

Acaulis, simplex. *Folia* dense rosulata, erecto-patentia, lineari-lanceolata, longe acuminata, circa 35 cm. longa, 6–8 cm. lata et 1·3–1·5 cm. crassa, faciebus convexis, supra obscure viridia, maculis albidis lineari-oblongis saepe geminatis vix fasciatim dispositis sed saepissime confluentibus marmorata, lineisque concoloribus obscurioribusque praesertim secus margines striato-nervata, subtus pallide viridia, immaculata; margines sinuato-dentati, aculeis deltoideis apice corneis brunneis pungentibus 3–6 mm. longis armati. *Inflorescentia* 0·8–1·3 m. alta; scapus glaucus, infra medium ramosus, ramis lateralibus 8–13, erecto-patentibus, terminali brevioribus; racemi superne densi. 4–10 cm. longi; pedicelli circa 1·5 cm. longi; bracteae scariosae, deltoideae, subulatae, 3-nerviae, 1–1·5 cm. longae. *Perianthium* pallidum, incarnatum, supra ovarium leviter constrictum, faucem versus leviter ampliatum et curvatum, 3 cm. longum, subhexagonum; segmenta ultra medium connata, marginibus albidis, medio pallide striato-nervata, apice leviter recurvula, intus luteola. *Filamenta* vix exserta; antherae oblongae, aurantiacae.

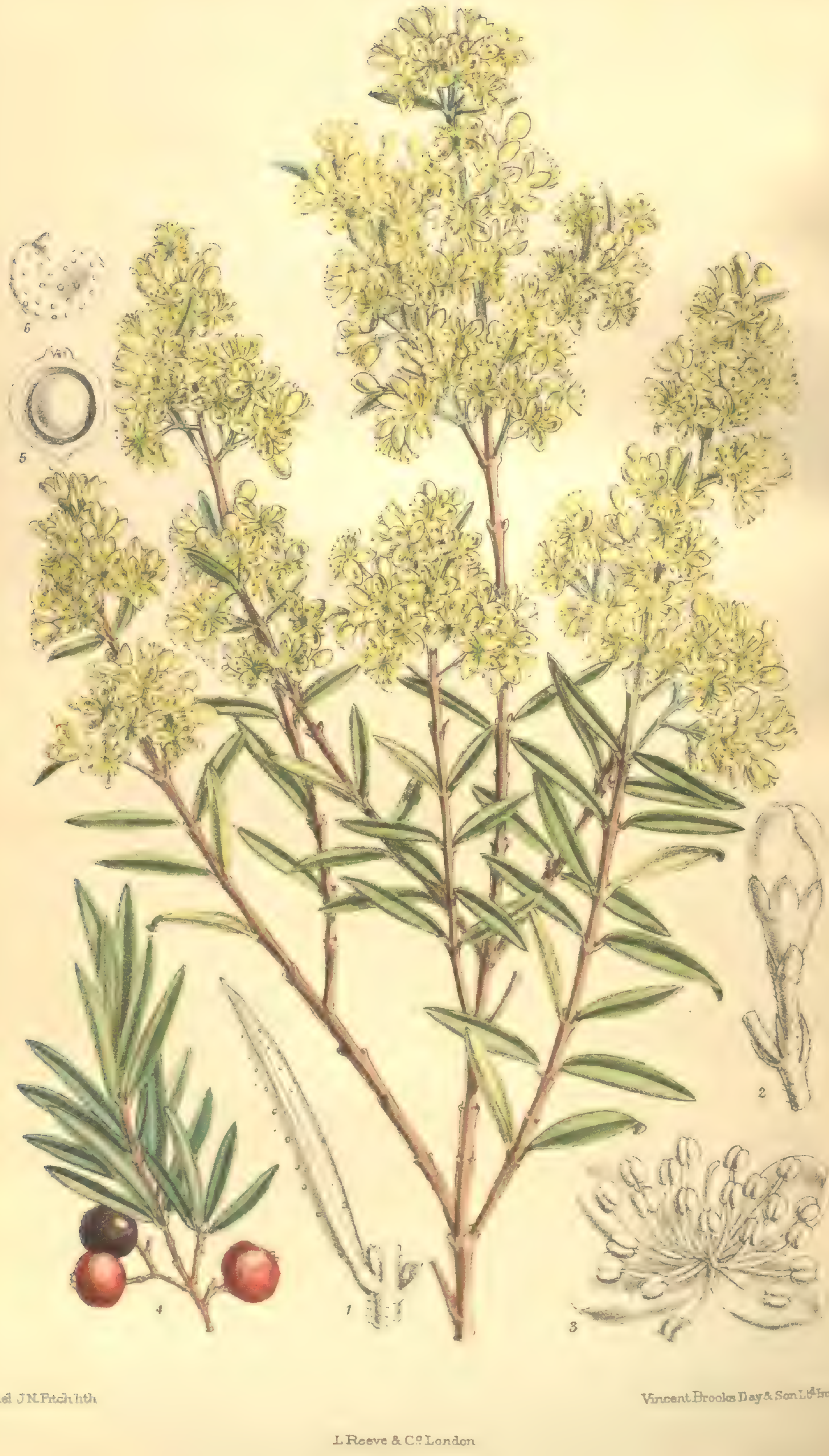
The plant of *Aloe pallidiflora*, Berger, here figured flowered in the garden of Sir Thomas Hanbury at La Mortola in April, 1906. It was obtained some years ago, without name, from the Royal Botanic Gardens, Berlin, and first flowered in March, 1904. Its native country is unknown, but it certainly is not from German South-West Africa, nor from German East Africa, neither have I seen it in any of the herbaria to which I have had access. Possibly it is a native of South Africa, and perhaps of the eastern regions, as it seems to me to be related to *A. Greatheadi*, Schoenland, in "Records Albany Museum," vol. i. p. 121, and *A. transvaalensis*, O. Kunze, in "Rev. Gen." vol. iii. 2, p. 314, both natives of the Transvaal.

So far it has produced a few capsules, but the seeds did not germinate, neither has it thrown up suckers as so many of its near allies generally do. At La Mortola it is quite hardy, though last year the flower-spike and the tops of the leaves seem to have suffered from the cold of the previous winter.

March 1st, 1907.

Descr.—A stemless plant. *Leaves* in a dense rosette, erecto-patent, linear-lanceolate, tapering into a long point, about 14 in. long, $2\frac{1}{2}$–3 in. wide, and $\frac{1}{2}$ in. thick, biconvex in section, dull green above and marbled with long, whitish marks, and nerved with similar lines, especially near the margin, pale green and unspotted beneath; margins sinuate and armed with brown, deltoid, horny, sharp spines as much as $\frac{1}{4}$ in. long. *Inflorescence* from $2\frac{1}{2}$–4 ft. high; scape glaucous, branched from below the middle; branches 8–13, erecto-patent, the terminal one the shortest; pedicels about $\frac{5}{8}$ in. long; bracts scarious, deltoid, subulate, 3-nerved, about 1 in. long. *Perianth* pale flesh-colour, yellowish inside, $1\frac{1}{4}$ in. long; tube slightly constricted above the ovary, curved and slightly swollen near the throat, somewhat hexagonal; lobes not quite as long as the tube, with whitish margins and central striped area, slightly recurved at the apex. *Filaments* scarcely exserted; anthers oblong, orange.—Alwin Berger.

Figs. 1 and 2, stamens; 3, pistil:—*all enlarged.*



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Tab. 8123.

BLEPHAROCALYX SPIRAEOIDES.

Brazil.

MYRTACEAE. Tribe MYRTEAE.

BLEPHAROCALYX, *Berg.*; *Niedenzu in Engl. & Prantl, Pflanzenf.* vol. iii. 7, p. 71, *Benth. et Hook. f. Gen. Plant.* vol. i. p. 715, sub Myrto.

Blepharocalyx spiraeoides, *Stapf;* affinis *B. angustifolio,* sed foliis minoribus obtusis, panicula densiflora, cymis bifloris, sepalis aequalibus vix albo-marginatis, petalis majoribus, bacca majore distinctus.

Frutex multiramosus, densus, 3 m. altus, ramis gracilibus tenuissime puberulis tandem cortice fusco tectis. *Folia* lanceolato-linearia, utrinque obtusa, 1–2 cm. longa, 2–3 mm. lata, tenuiter coriacea, glabra, viridia, subtus pallidiora, marginibus recurvis, nervis lateralibus inconspicuis; petiolus vix 1 mm. longus. *Cymae* bifloraе, in paniculas multifloras densas (hinc inde foliis admixtas) collectae; pedunculi pedicellique graciles puberuli; bracteae elliptico-ovatae, parvae; bracteolae ad calycis basin sitae, rotundatae; pedicelli 1·5-2 mm. longi. *Receptaculum* obovoideum, glabrum, 0·8 mm. longum. *Calyx* receptaculo aequilongus vel paulo longior, segmentis 4 rotundato-ovatis ciliatis. *Petala* 4, late elliptica, concava, pallide flava, ciliata, 3 mm. longa. *Stamina* circiter 18, longiora petala aequantia. *Ovarium* 2-loculare, ovulis biseriatis, 6 in unaquaque placenta, placentis vix prominentibus. *Bacca* globosa, 8 mm. diametro, rubra vel tandem violaceo-nigricans. *Semen* unicum (semper ?); testa crustacea, tenuis. *Embryo* curvatus, glandulosus, cotyledonibus minutis.

This is a very handsome and freely flowering shrub, somewhat of the habit of a *Spiraea*, and it thrives well in a warm house. The plant from which the drawing was made was received from Baron Capanema, Director of Telegraphs of Brazil, in 1885. There are no specimens of the wild plant at Kew, and its exact habitat is unknown. The area of the genus extends almost over the whole of South America, reaching to 42° S. lat. in Chile. It is, however, doubtful whether all the species referred to *Blepharocalyx* belong to that genus, and even whether it should be retained as distinct from *Myrtus*, from which it differs mainly in having a thin, crustaceous testa, instead of a thick, bony one.

Descr.—A much-branched shrub, about 9 ft. high, with slender, finely pubescent branches. *Leaves* lanceolate-linear, obtuse at both ends, $\frac{1}{2}$–$\frac{3}{4}$ in. long, $\frac{1}{1\,2}$–$\frac{3}{2\,4}$ in. broad, thinly coriaceous, glabrous, green, with recurved margins, and very short petioles. *Cymes* 2-flowered, arranged in

dense, many-flowered panicles; peduncles and pedicels slender, puberulous; bracts elliptic-ovate, small; pedicels up to $\frac{1}{12}$ in. long. *Receptacle* obovoid, glabrous, about $\frac{1}{30}$ in. long. *Calyx* as long as the receptacle, with four rotundate-ovate, ciliate segments. *Petals* 4, broad-elliptic, concave, pale yellow, ciliate, $\frac{1}{8}$ in. long. *Stamens* about 18, the longest as long as the petals. *Ovary* 2-celled; ovules about six in each cell, in two rows. *Berry* globose, $\frac{1}{3}$ in. in diameter, red, or at length violet-black. *Seed* solitary; testa thin, crustaceous. *Embryo* curved, glandular; cotyledons minute.—Otto Stapf.

Fig. 1, a leaf; 2, bud; 3, flower; 4, fruit; 5, fruit, cut open; 6, embryo:—*all enlarged*, excepting fig. 4.

M S del. J.N Fitch lith

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Tab. 8124.

PRIMULA deorum.

Bulgaria.

Primulaceae. Tribe Primuleae.

Primula, *L.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 631.

Primula (§ **Auricula**) **deorum**, *Velen. in Véstnik Kral. česk společn. nauk.* 1890, p. 55 (*Sitzb. Boehm. Gesell. Wiss.* 1890); *Fl. Bulgar.* 1891, p. 479; *Suppl.* vol. i. 1898, p. 242; *Hindmarsh in Journ. Roy. Hort. Soc.* vol. xxix. (1904), p. 32, f. 1; *Flora & Sylva*, vol. ii. (1904), p. 239; *Masters in Gard. Chron.* 1905, vol. xxxvii. p. 98, f. 44; *Pax & Knuth in Engler, Pflanzenr. Primul.* 1905, p. 146; *Reuthe in The Garden*, 1905, p. 327; species ex affinitate *P. glutinosae* a qua planta majore et foliis saepius omnino integris differt.

Perennis omnino glabra, ad scapum superne et pedicellos valde glutinifera, rhizomate crasso carnoso interdum ramoso. *Folia* 6–12, crassa, coriacea, spathulato-lanceolata, vel interdum fere linearia, 3–8 cm. longa, vix acuta, integra vel rare supra medium paucidentata. *Scapi* solitarii, graciles, 8–15 cm. longi, saepius 5–10-flori, vel in culto interdum usque ad 18–22 cm. alti et 20-flori, umbella unilaterali. *Involucri* bracteae lineares, pedicellis longiores, basi haud saccatae; pedicelli 3–10 mm. longi. *Flores* purpureo-violacei vel sanguineo-purpurei, speciosi. *Calyx* carnosus, 4–5 mm. longus, ad medium fissus, laciniis obtusis. *Corolla* hypocraterimorpha; tubus gracilis, circiter 1–2 cm. longus; limbi circiter 1·5 cm. diametro lobi imbricati, bifidi, segmentis rotundatis. *Genitalia* inclusa. *Capsula* globosa, calyce non accrescente inclusa.

Dr. J. Velenovsky discovered this fine Auricula in 1890, growing in humid, grassy places, within the snows (*inter nives*), at the sources of the River Isker, near the summit of the Rilo Dagh, South-western Bulgaria; and it has since been found in the Muss Alla Dagh and the Despoto Dagh, in the same region. Mr. H. J. Elwes, F.R.S., collected it in the original locality in 1899, at an elevation of between "4,000 and 7,000 ft." Velenovsky gives the altitude as 2,500 metres—about 8,200 ft., whereas Pax and Knuth give 2,600 to 2,700 metres, equal to about 8,500 to 8,850 ft. Some uncertainty prevails as to who first introduced this plant into cultivation. Pax and Knuth say "in cultivation since 1904, introduced by Messrs. Stansfield," and Mr. Hindmarsh, in whose garden at Alnwick it flowered in 1904, states that it had probably not flowered before in this country; but records prove that *Primula deorum* has been in cultivation at Kew ever since April, 1892, and Mr. G. Reuthe, in the place cited above, gives what is doubtless the true history of its introduction into cultivation. According to him, Mr. Max

Kolb, of the Royal Botanic Gardens, Munich, sent [probably on the garden account] Mr. Kellerer (now Superintendent at Sofia) to Bulgaria in 1891, to procure living plants of *P. deorum* and other Bulgarian rarities. Some of these came into his (Reuthe's) possession, and he disposed of them to Mr. Thomas Ware, of Tottenham. They grew into "magnificent specimens," and flowered in 1892, when they were exhibited at one of the shows of the Royal Horticultural Society as well as at the Royal Botanic Society at Regent's Park. I have not been able to find any record of these events in the gardening papers of that date, and *Primula deorum* is not included in either of the Kew Lists of New Plants of that period; but it is offered in Ware's Catalogue for 1894.

The first plant cultivated at Kew was received from the Munich Botanic Garden in April, 1892. Subsequently another plant, or plants, was obtained from Mr. Thos. Ware; in 1904 a further supply was obtained from Mr. Max Leichtlin, and it was from one of these plants, which flowered in May, 1906, that the drawing for the accompanying plate was made.

Although the "Primula of the Gods" has been successfully grown in some gardens, it is no doubt a difficult subject, and it does not flourish in the open at Kew. It flowered in Mr. Hindmarsh's Rock Garden on a north exposure, in sandy loam, at the foot of a broad stone. Mr. Velenovsky does not explain why he gave this plant the specific name *deorum*, but it was probably not given on account of its surpassing in beauty all other European species, though at its best it is no doubt very ornamental.

Descr. — Perennial, glabrous in all parts. *Rhizome* thick, fleshy. *Leaves* from 6–12 in a loose rosette, thick, leathery, spathulate-lanceolate, $1\frac{1}{2}$–$3\frac{1}{2}$ in. long. *Scape* solitary, 7–9 in. high, 15–20-flowered, very glutinous in the upper part. *Bracts* about as long as the flower-stalks, the longest of which are about an inch long. *Flowers* violet-purple or crimson-purple, about $\frac{3}{4}$ in. in diameter. *Corolla-lobes* notched. *Stamens* and pistil included in the corolla-tube. *Capsule* small, enclosed in the calyx which does not enlarge.—W. Botting Hemsley.

Fig. 1, calyx and pistil; 2, section of corolla showing some of the stamens; 3, ovary :—*all enlarged.*

M. S. del. J. N. Fitch, lith.

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Tab. 8125.

CAIOPHORA CORONATA.

The Andes.

Loasaceae. Tribe Loaseae.

Caiophora, *Presl*; *Urb. et Gilg. in Nov. Act. Nat. Cur.* vol. lxxvi. p. 268. Blumenbachia, *Benth. et Hook. f. Gen. Plant.* vol. i. p. 805. partim.

Caiophora coronata, *Hook. et Arn. in Hook. Bot. Misc.* vol. iii. (1833), p. 327, *Urb. et Gilg.* l.c., p. 278; *Reiche, Fl. Chile,* vol. iii. p. 251; habitu ad *C. cirsiifoliam,* Presl, et *C. cymbiferam,* Urb. et Gilg, accedit; ab ambabus speciebus foliis magis dissectis, squama nectarifera fila 3 dorsalia gerente et staminodiis interioribus exappendiculatis recedit.

Herba perennis. *Caules* plures, satis elongati, basi decumbentes. *Folia* opposita, decussata, infima rosulata, longipetiolata, ambitu ovata usque lanceolata, bipinnatisecta, pinnis ambitu ovatis usque lanceolatis, pinnulis integris vel serrato-dentatis, utrinque setis longis horridula, subtus subcano-pubescentes. *Flores* pseudolaterales, pentameri. *Calyx* dense setosus; lobi pinnatisecti. *Petala* cymbiformia, circ. 3·5 cm. longa, extra setosa et pubescentia, intus glabra. *Squamae nectariferae* rectangulares (explanatae), vix 5 mm. longae, circiter 5 mm. latae, leviter trilobatae, lobis circ. 0·5 mm. longis, intermedio circ. 3 mm. lato, dorso fila tria circ. 1·5 mm. supra basin gerentes. *Staminodia interiora* exappendiculata. *Capsula* obovoideo-obconica, decemnervis, recta.—*C. absinthiifolia,* Presl, Rel. Haenk. vol. ii. p. 43. *Blumenbachia coronata,* Haage et Schmidt in Rev. Hortic., 1874, p. 58, figs. 9, 10. *Loasa coronata,* Gill. ex Arn. in Edinb. Journ. Geogr. Sc. vol. iii. (1831), p. 274. *L. pilosa,* Meyen, Reise, vol. i. p. 470.

The *Loasaceae* afford a good example of discontinuous distribution, twelve of the thirteen genera being endemic in America, and one, *Kissenia,* in Africa and Arabia. The family is perhaps best known on account of the long, stinging bristles which clothe most of the species.

Another kind of hair, very characteristic of the *Loasaceae,* is much smaller, and provided with numerous barbs, by which the hairs readily become fixed in the skin of any animal touching them.

The terete stem of *Caiophora,* and the much dilated or trifurcate placentas, distinguish the genus from *Blumenbachia,* with which some authors have united it. The home of *Caiophora* is in the Andes of Chile, the Argentine Republic, Bolivia, and Peru; a single species, however, is found in Ecuador, one in Uruguay, and two or three in the south of Brazil.

C. coronata is the most widely distributed species, and has been found at altitudes of 9,300–14,600 ft. above the

sea in the Andes, from the Argentine Republic to Peru. Seeds of it were collected in February, 1902, at about 10,000 ft., on the Argentine side of the Portillo Pass, east of Santiago, by Mr. H. J. Elwes, F.R.S., who raised a fine plant in his garden, and communicated the flowering stem represented in the accompanying figure.

C. coronata was first introduced from Chile (in 1872, according to Nicholson's Dictionary of Gardening) by Messrs. Haage & Schmidt, and was figured by them as *Blumenbachia coronata* in the "Revue Horticole" for 1874. Urban and Gilg, in their monograph of the *Loasaceae*, reduce *B. coronata*, Haage et Schmidt, to *Caiophora superba*, but the figures and description in the "Revue Horticole" leave little doubt that it is the true *C. coronata*, Hook. et Arn.

Five other species of *Caiophora* have appeared in this Magazine, namely: *C. aequatoriana*, t. 6134 (*Blumenbachia contorta*); *C. superba*, t. 6143 (*Blumenbachia chuquitensis*); *C. lateritia*, t. 3632, and *C. Pentlandii*, t. 4095 (both under *Loasa*); and *C. canarinoides*, t. 5022 (under *Illairea*).

Descr.—A perennial herb. *Stems* several from the base, decumbent. *Leaves* opposite and decussate, with a long petiole, bipinnatisect, armed on both surfaces with long stinging bristles, and whitish-pubescent on the lower surface with small barbed hairs. *Flowers* pentamerous. *Calyx* densely clothed with long bristles; lobes pinnatisect. *Petals* white, boat-shaped, contracted at the base, about $1\frac{1}{2}$ in. long, bristly and pubescent outside, glabrous inside. *Nectaries* rectangular when flattened out, hardly $\frac{1}{5}$ in. long, and only slightly broader, bearing three thread-like processes outside, about a third above the base, shallowly 3-lobed, the middle lobe much broader than the lateral ones. *Inner staminodes* without appendages. *Capsule* straight, with ten prominent nerves.—T. A. Sprague.

Fig. 1, hairs from leaf; 2, nectary; 3, an inner staminode; 4, top of ovary and style:—*all enlarged.*

M.S. del. J.N. Fitch lith

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Tab. 8126.

PAPHIOPEDILUM VILLOSUM, var. ANNAMENSE.

Annam.

ORCHIDACEAE. Tribe CYPRIPEDIEAE.

PAPHIOPEDILUM, *Pfitzer Morphol. Stud. Orchideenbl.* p. 11 (ex parte): *Rolfe in Orch. Rev.* 1896, p. 363 (char. restrict.); *Benth. et Hook. f. Gen. Plant*, vol. iii. p. 635 (Cypripedium, § Coriaceae).

Paphiopedilum villosum, *Pfitzer*, var. **annamense**, *Rolfe* (nov. var.); a typo foliis longioribus et angustioribus, sepalo postico gilvo et disco viridi atropurpureo-fasciato differt.

Herba caespitosa. *Folia* suberecta vel arcuata, lineari-oblonga, bidentata, coriacea, 20–40 cm. longa, 2–2·5 cm. lata, saturate viridia, basi brunneo-maculata. *Scapus* validus, erectus, villosus, 15–25 cm. altus, viridis, brunneo-maculatus, uniflorus. *Bracteae* elliptico-oblongae, subobtusae, conduplicatae, circa 4 cm. longae. *Flores* ampli. *Ovarium* villosissimum. *Sepalum* posticum erectum, obovato-orbiculare, obtusum, ciliolatum, margine prope apicem incurvum, apud basin recurvum, circa 4·5 cm. longum, gilvum, disco viride atropurpureo-fasciatum. *Petala* divaricata, obovato-oblonga, obtusa, ciliolata, laeviter undulata, circa 6 cm. longa, pallide flava, brunneo-fasciata. *Labellum* calceiforme, circa 4 cm. longum, ore dilatatum, flavum, fronte brunneo-suffusum, lobi laterales rostrati. *Columna* parce villosa; staminodium orbiculari-ellipticum, subconcavum, circa 1·5 cm. longum, apice tridentatum, basi bilobum, medio papilla erecta instructum.

The typical form of *Paphiopedilum villosum*, Pfitzer, is a native of Burma, which was discovered and introduced to cultivation over half a century ago, and for a long period has been one of the most popular winter-flowering species of the genus. A somewhat different form has now appeared, having been sent from Annam by Mr. W. Micholitz, when collecting there for Messrs. Sander & Sons. A plant in flower was presented to Kew by the importers about a year ago, from which the annexed plate was prepared, and owing to the longer, narrower and more erect leaves, together with a marked difference in the colour of the dorsal sepal, it was proposed to distinguish it as above. A plant exhibited at a meeting of the Royal Horticultural Society last March by Messrs. Sander possessed the same peculiarity, and we understand that it applies to the whole importation. Indeed, when out of flower, it was taken for something quite different. It appears to be a distinct geographical form, but in the present state of our knowledge it seems best to accord it varietal rank only. These

Annamese importations have proved surprisingly rich in novelties, and there are other geographical problems on which they may throw light when the results are better known.

Descr.—A dwarf tufted herb, about a foot high. *Leaves* erect or arching, linear-oblong, bidentate at the apex, coriaceous, 8–16 in. long, nearly an inch broad, dull green, spotted with brown at the conduplicate base. *Scape* stout, erect, villous, 6–10 in. high, green, spotted with brown, one-flowered. *Bracts* elliptic-oblong, subobtuse, conduplicate, over $1\frac{1}{2}$ in. long. *Flowers* large. *Ovary* shaggy. *Upper sepal* erect, obovate-orbicular, obtuse, slightly ciliate, nearly 2 in. long, with the margin somewhat incurved at the apex and recurved at the base, cream-coloured, veined and suffused with dark purple on the disc, which is slightly margined with green; lower elliptic-oblong, acute, about as long as the lip. *Petals* spreading, obovate-oblong, obtuse, ciliolate, slightly undulate, about $2\frac{1}{2}$ in. long, light yellow, veined and reticulated with brown. *Lip* slipper-shaped, about $1\frac{1}{2}$ in. long, yellow, suffused with brown in front, mouth somewhat dilated, side lobes nearly $\frac{1}{2}$ in. long. *Column* somewhat villous; staminode orbicular-elliptic, $\frac{1}{2}$ in. long, somewhat concave, tridentate at the apex, bilobed at the base, and with an erect fleshy tooth in the centre.—R. A. Rolfe.

Fig. 1, column, showing stamens, staminode, and stigma; 2, the whole plant:—1, *enlarged*, 2, *much reduced*.

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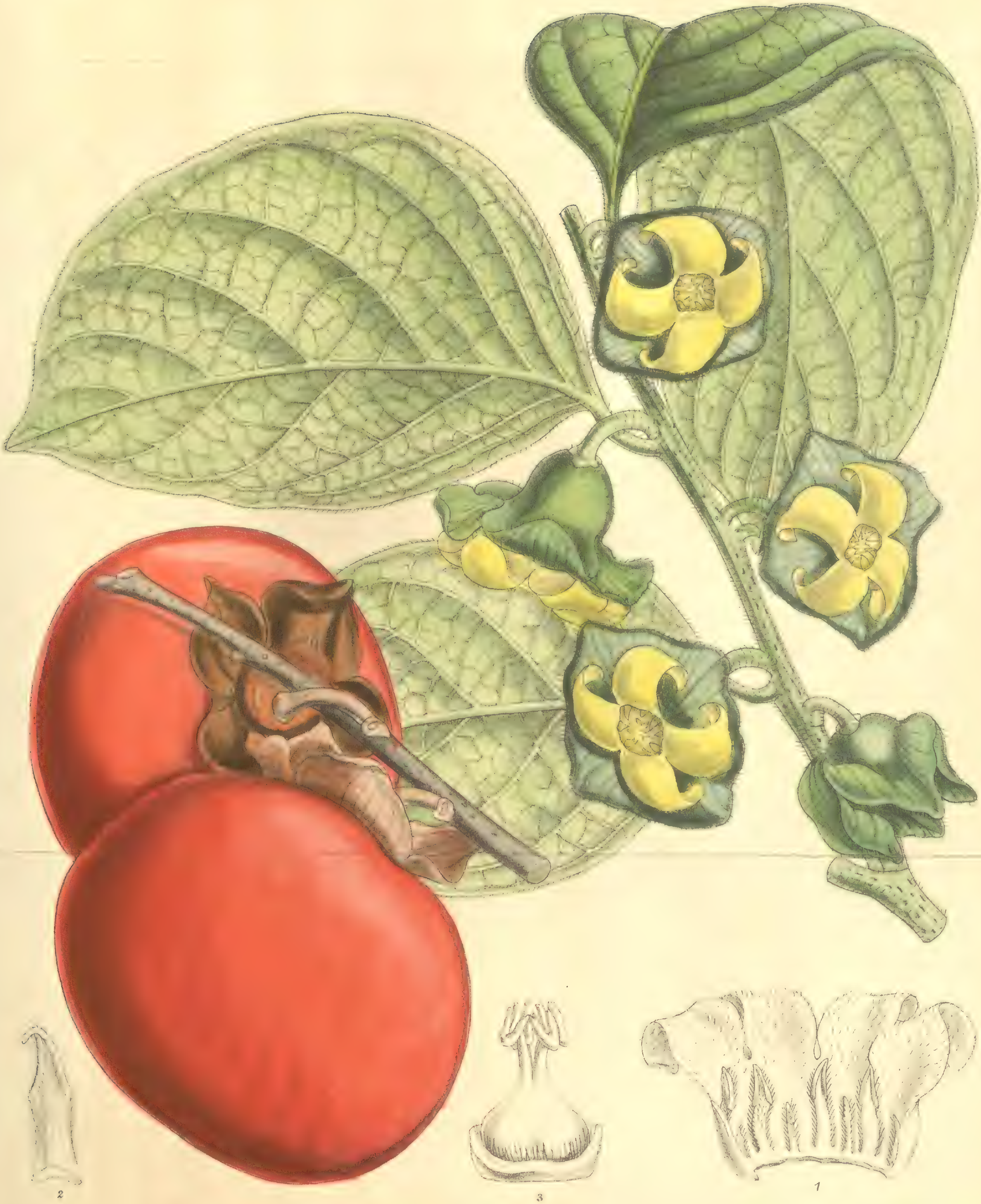

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M.S. del. J.N. Fitch lith.

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Tab. 8127.

DIOSPYROS Kaki.

Eastern India, China, and Japan.

Ebenaceae.

Diospyros, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 665.

Diospyros Kaki, *Linn. f. Suppl.* 1781, p. 439; *Thunb. Fl. Jap.* 1784, p. 157; *Lit. Hort. Kew.* ed. 2, 1813, vol. v. p. 478; *DC. Prodr.* 1844, vol. viii. p. 229, excl. var. *glabra*; *Hiern in Trans. Camb. Phil. Soc.* 1873, vol. xii. p. 227; *Wight Ic. Pl. Ind. Or.* 1842, vol. ii. t. 415; *Bretsch. Early Res.* 1881, pp. 5, 23, 29, *et Europ. Bot. Discov. in China*, 1898, p. 830; *W. W. in Gard. Chron.* 1893, vol. xiv. p. 682; *Sargent, For. Fl. Jap.* 1894, p. 50; species ex affinitate *D. Loti*, a qua floribus femineis distincte pedunculatis, calyce sericeo, corolla extus tomentosa et fructu majore differt.

Arbor parva habitu *Pyri Mali*, dum juvenilis jam fructuosa. *Ramuli* florigeri pubescentes. *Folia* alterna, decidua, breviter petiolata, lanceolata, oblonga, elliptica vel interdum fere orbicularia, interdum usque ad 20 cm. longa sed saepius minora, subtus primum pubescentia denique glabra. *Flores masculi* parvi, axillares, terni, tetrameri. *Calyx* campanulatus, lobis ovatis vel lanceolatis. *Corolla* urceolata, extus pubescens. *Stamina* saepius 16, pubescentia. *Flores feminei* axillares, solitarii, tetrameri, flavo-virides, circiter 4 cm. diametro. *Calycis lobi* crassi, late ovati vel semiorbiculares, obtusi, fructu valde accrescentes, persistentes. *Corollae* coriaceae pilosae lobi oblongo-rotundati, arcte recurvi. *Staminodia* saepius 8, pilosa, alterna staminibus fertilibus similia, alterna multo minora, corollae lobis opposita. *Ovarium* 8-loculare, basi pilosum; stylus inclusus, stigmatibus 4 bifidis. *Fructus* saepe magnus, globosus, sed forma ac magnitudine valde variabilis.—*D. chinensis*, Blume, Cat. Gew. Buitenz. 1823, p. 110. *D. Schitze*, Bunge, Enum. Pl. Chin. Bor. 1834, p. 42. *D. costata*, Carr. in Rev. Hort. 1869, p. 284 et 1870, p. 410, cum ic. color. *D. Roxburghii*, Carr. op. cit. 1872, p. 253, ff. 28 et 29. *D. Mazeli*, Carr. 1874, p. 70 cum ic. color. *D. Lycopersicon*, Carr. op. cit. 1878, p. 470, cum ic. color.*

The genus *Diospyros* numbers nearly 200 species, widely spread in tropical and subtropical countries; rarer in temperate regions, and not represented in extra-tropical South America, Southern Australia, or New Zealand. *D. Kaki*, as defined by Hiern, Franchet, and Savatier, and other botanists, is a very variable species, including a number of forms regarded as species by some botanists. Whether the numerous and very different varieties of Date Plum cultivated in China and Japan have descended from

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* The synonyms of the Kaki are numerous, and only the more important ones are given here; but it is proposed to reproduce the complete synonymy, together with some gleanings from the literature of the subject, in an early number of the "Kew Bulletin."

April 1st, 1907.

one or more wild species is a difficult question to answer, and it will not be attempted here. *Schi-tze* is the Chinese and *Kaki* the Japanese name of the tree and the fruit of *D. Kaki*, and the earliest descriptions and records of it are to be found in the writings of the Jesuit missionaries. The first is Alv. Semedo, whose work entitled "Relatione della grande Monarchia della Cina" appeared in 1643. We have not seen this book, but Bretschneider quotes the author as stating that the best varieties of the *Su-tzu* (the name of the fruit in the Amoy dialect) were grown in the colder parts of China, namely, in Honan, Shensi, Shansi, and Shantung. The oldest book at Kew in which we find a figure and description is Boym's "Flora Sinensis" (1656), where it appears under the name *Su-pim*—"arbor et fructus su-pim apud sinas tantum nascitur," etc. On this Bretschneider remarks: "The Chinese name given by Boym properly denotes the dried fruit, for the second character means cake."

Passing over all other records up to 1813, we find that *D. Kaki* was introduced into cultivation in this country by Sir Joseph Banks in 1789, under the popular name of Japanese Date Plum. *D. Lotus*, L., and *D. virginiana*, L., were previously in cultivation, as the European Date Plum and the American Date Plum respectively. Persimmon is the name commonly employed in America, but Date Plum is also given as a synonym in some American books, and the Japanese use Persimmon in their English publications. A sheet containing coloured figures of forty-five varieties of "Japanese Persimmons" was issued some years ago by the Agricultural Bureau of Tokio.

Although introduced more than a century since, the Kaki has never become in the least popular in the United Kingdom, and it is doubtful whether it has been continuously in cultivation. There are several records, however, of different varieties bearing fruit, among them *D. costata*, in Sir William Hutt's garden in the Isle of Wight, in 1875; but it is not stated whether it was under glass or in the open air. From the observations of travellers it would seem that some varieties are hardier than others, and it is possible that the hardier ones have not been introduced. But from the experience of French cultivators the Kaki succumbs to severe winters in the latitude of

Paris, and it is only in the Mediterranean region that it is really at home out-of-doors. In this country it thrives perfectly in an ordinary orchard-house or greenhouse, and it is both ornamental and useful. Whether it would pay to grow it for market depends upon the public taste. The variety figured has a delicious fruit when quite ripe—that is when the pulp has become so soft that a spoon is needed to take it up. Fruit that commences to colour in September or October is not ready for use before February, but it is good to look at.

The plant from which the drawing was made was purchased in 1890 from C. Sahut, nurseryman at Montpellier, and it first bore fruit in 1893. Since then it has fruited annually, and this season it bore eighteen fruits. It is a standard now only about 7 ft. high, with a stem 2 in. in diameter, and a spread of branches of about 4 ft. There is no male plant at Kew, so that the fruit is developed without fertilization having taken place, but it is quite seedless, or only imperfect seeds are formed. We believe it to be the same as Carrière's *D. Lycopersicon*, but some of the varieties so closely resemble each other that it would be rash to decide from a figure. It is also near the same author's *D. Mazeli*, which may or may not be the same as *D. Mazelii*, Thib. et Ketel. ex E. Morr. in the "Belgique Horticole," 1874, vol. xxiv. p. 111.

Descr.—A small dioecious tree resembling an apple-tree, and bearing fruit while quite young. *Leaves* alternate, deciduous, very variable in shape, sometimes as much as 8 or 10 in. long. *Male flowers* pubescent, smaller than the female, axillary, usually in clusters of three, tetramerous. *Stamens* usually 16. *Female flowers* axillary, solitary, green and yellow, $1\frac{1}{2}$–2 in. across, almost leathery, hairy, tetramerous. *Calyx-lobes* broadly ovate, or semi-orbicular, enlarging in fruit, persistent. *Corolla-lobes* oblong, rounded, strongly recurved. *Staminodes* 8, hairy, 4 large, resembling fertile stamens, 4 smaller, opposite the petals. *Ovary* 8-celled, with a ring of hairs around the base; style included; stigmas 4, bifid. *Fruit* often large and globose, but very variable in size and shape in the numerous cultivated varieties.—W. Botting Hemsley.

Fig. 1, a corolla laid open, showing the staminodes; 2, one of the larger staminodes; 3, pistil:—*all enlarged.*

M.S. del. J.N. Fitch lith.

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Tab. 8128.

ARCTOSTAPHYLOS Manzanita.

California.

Ericaceae.

Arctostaphylos, *Adans.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 581.

Arctostaphylos Manzanita, *Parry in Bull. Calif. Acad.* vol. ii. p. 491; *Sargent in Garden & Forest,* vol. iv. p. 565, fig. 90, p. 571; *Rehder in Cycl. Amer. Hortic.* vol. i. p. 91; ab *A. pungente*, H. B. K., quacum saepe confusa, foliis latis obtusis, inflorescentia elongata, fructu majore, et tempore florendi differt.

Frutex vel *arbor* ad 10 m. alta, coma perlata; truncus et rami vetusti cortice laevi rubra in squamas amplas soluta; rami juniores magis minusve pubescentes, pube cinerea vel nigricante glandulis intermixtis, deinde glabrati. *Folia* ovata vel ovato-elliptica, obtusa vel acuta, 3·5–4 cm. longa, 1·5–3·5 cm. lata, coriacea, primo pubescentia, mox glabrata, nervis tenuibus; petiolus 5–8 mm. longus, pubescens. *Panicula* brevis, ovoidea vel corymbosa, multiflora, cum pedunculo brevi ad 4 cm. longa, pedicellis plerumque glabris exceptis undique glanduloso-pubescens; bracteae persistentes, e basi ovata longe acuminatae; pedicelli ad 6 mm. longi. *Calyx* albo-roseus, segmentis 2 mm. longis. *Corolla* urceolata, ovoidea, 7 mm. longa, alba vel carnea, lobis minutis. *Filamenta* e basi lata subulata, pilosa; antherae purpureae, elliptico-globosae uti aristae recurvae papilloso-asperae. *Baccae* depresso-globosae, 6 mm. altae, 8–12 mm. diametro, primo albidae, demum fusco-rubrae.

"Manzanita" is the Californian vernacular for *Arctostaphylos* generally. Of the ten or eleven species of that genus found in California, this is no doubt the handsomest. It is a common and characteristic plant from the foothills of the coast ranges near the Bay of San Francisco, northwards to the high Sierras on both sides of the Sacramento Valley. Within this great altitudinal range it varies considerably in height and general appearance. At high levels a low shrub, it attains the dimensions of a tree at low altitudes and in good and well-watered soil; but more commonly it might be described as a tall, sprawling shrub. A photograph of a particularly fine specimen was reproduced by Prof. Sargent in "Garden and Forest," l.c. It measured between 20 and 25 ft. in height, with a trunk nearly 13 ft. in girth near the ground and a crown more than 66 ft. in diameter. The specimen at Kew, which was raised from seeds purchased from an American nurseryman in 1897, measures at present a little over 3 ft. in

height and width. It flowers in its native country according to the situation at any time between Christmas and May. At Kew, where it is quite hardy, the flowers are produced in early spring and last about a month. Like other arborescent species of *Arctostaphylos* it sheds its bark annually. This peels off in May or June in large, loose flakes, laying bare the green new bark which soon turns red. *A. pungens*, H. B. K., with which *A. Manzanita* has been confused, is a native of Mexico, an autumn flowerer with narrower leaves and shorter, smaller inflorescences.

Descr.—A *shrub* or a tree, up to over 30 ft. high, with a wide spreading crown; young branches more or less pubescent and glandular, at length glabrescent. *Leaves* ovate or elliptic-ovate, obtuse or acute, shortly mucronate, rounded or acute at the base, $1\frac{1}{2}$–$1\frac{3}{4}$ in. long, $\frac{2}{3}$–$1\frac{1}{2}$ in. broad, coriaceous, finely pubescent when young, soon glabrous; petiole $\frac{1}{5}$–$\frac{1}{3}$ in. long, pubescent. *Panicle* short, ovoid or corymbose, many-flowered, with the short peduncle up to $1\frac{2}{3}$ in. long, glandular-pubescent with the exception of the usually glabrous pedicels; bracts persistent, long-acuminate from an ovate base; pedicels up to $\frac{1}{4}$ in. long. *Calyx* pinkish-white, segments $\frac{1}{12}$ in. long. *Corolla* urceolate, ovoid, somewhat over $\frac{1}{4}$ in. long, white or pinkish, with minute lobes. *Berry* depressed-globose, $\frac{1}{4}$ in. long, $\frac{1}{3}$–$\frac{1}{2}$ in. in diameter, ultimately brownish-red.—Otto Stapf.

Fig. 1, flower; 2, pistil with disk and part of the calyx; 3 and 4, stamens:—*all enlarged.*

M.S. del. J.N. Erichsen lith.

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Tab. 8129.

CALLIANDRA portoricensis, *var.* major.

Mexico and Central America.

Leguminosae. Tribe Mimoseae.

Calliandra, *Benth.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 596; *Benth. in Trans. Linn. Soc.* vol. xxx. p. 536.

Calliandra portoricensis, *Benth. in Hook. Lond. Journ. Bot.* vol. iii. 1844, p. 99; *Trans. Linn. Soc.* vol. xxx. p. 543, var. **major,** *Sprague*, var. nov.; a typo calycis lobis deltoideis staminibusque subduplo longioribus recedit.

Frutex vel arbuscula usque ad 4·5 m. alta, ramulis subteretibus sulcatis leviter flexuosis, junioribus plus minusve pubescentibus vel tomentellis, adultis cinereo-corticatis. *Stipulae* lanceolatae, 4–8 mm. longae. *Folii pinnae* 2–7-jugae, foliolis 12–35-jugis linearibus vel lineari-oblongis 5–10 mm. longis 1–3 mm. latis apice obtusissimis interdum minute apiculatis basi truncatis margine ciliolatis ceterum appresse pubescentibus puberulis vel glabris. *Pedunculi* axillares, solitarii vel geminati, 3–8 cm. longi. *Capitula* ultra 30-flora, floribus sessilibus, ante anthesin versus apicem caulis corymbose disposita. *Calyx* circ. 1·75 mm. longus, lobis deltoideis 0·5 mm. longis superne pilis eglandulosis longe ciliatis inferne glanduloso-ciliatis. *Corolla* 5–6 mm. longa, lobis reflexis 2–3·5 mm. longis, 1·25–1·75 mm. latis. *Stamina* circ. 2·5 cm. longa, basi in tubum 1·5–2 mm. longum connata. *Legumen* 5–10 cm. longum.

The multitude of slender, pure-white filaments grouped together in the heads of flowers of this shrub gives them a delicate grace and charm, to which no figure can do justice; and when the most suitable treatment has been ascertained, the new variety should come into favour. It is a native of Mexico, Guatemala, and Nicaragua, and has been collected at elevations varying from 500 to 6,000 ft. above sea-level.

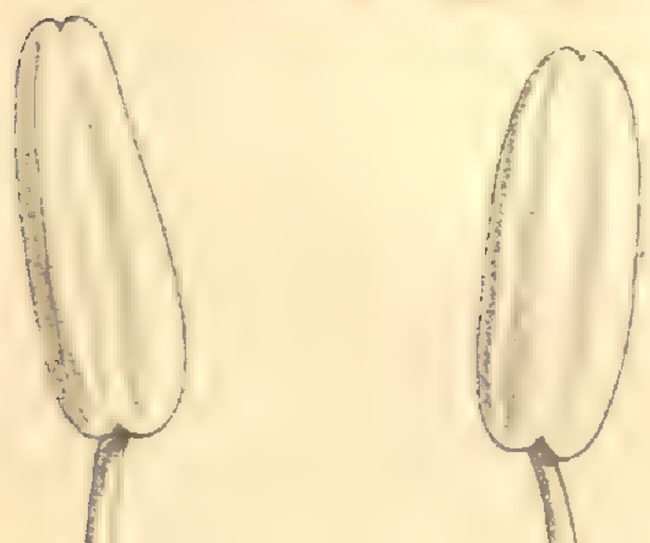
The Kew plants were purchased in 1906 from a nurseryman in Hyères as "Inga alba," and flowered in the Temperate House in June and July of that year.

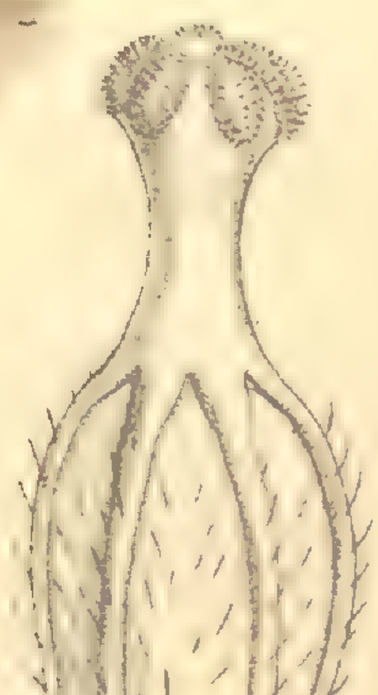
The variety *major* approaches *C. tetragona*, Benth. (Bot. Mag. t. 2651, as *Acacia quadrangularis*) in the size of the flowers and shape of the calyx-lobes, and is in fact intermediate between *C. tetragona* and typical *C. portoricensis*. The relationships of the three plants will be discussed in an early number of the "Kew Bulletin."

Descr.—A shrub or small tree. *Branchlets* subterete, grooved, slightly flexuous, more or less pubescent in the young state. *Stipules* lanceolate, up to $\frac{1}{3}$ in. long. *Leaves*

bipinnate, with 2–7 pairs of pinnae, each pinna with 12–35 pairs of leaflets; leaflets linear or linear-oblong, very obtuse, sometimes minutely apiculate, truncate at the base, minutely ciliate, appressed pubescent, puberulous or glabrous on both surfaces. *Peduncles* solitary, or two together in the axils. *Heads* about 2 in. in diameter, composed of more than 30 sessile pure-white flowers. *Calyx-lobes* deltoid, ciliate with non-glandular hairs in their upper half, and with gland-tipped hairs in the lower. *Corolla* about $\frac{1}{4}$ in. long, with reflexed lobes. *Stamens* about 1 in. long. *Pod* 2–4 in. long.—T. A. Sprague.

Fig. 1, leaflets; 2, a flower; 3, pistil:—*all enlarged.*





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Tab. 8130.

MECONOPSIS bella.

Himalaya.

Papaveraceae. Tribe Eupapavereae.

Meconopsis, *Vig.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 52; *Prantl & Kundig in Eng. & Prantl Pflanzenfam.* vol. iii. 2, p. 141.

Meconopsis (§ Eumeconopsis) **bella**, *Prain, Journ. As. Soc. Beng.* vol. lxiii. 2, p. 82; *Ann. Roy. Bot. Gard. Calcutta*, vol. ix. 1, p. 3, t. 4; *Gard. Chron.* 1906, vol. xl. p. 198, fig. 81; *Ann. Bot.* vol. xx. p. 351; species in genere ob folia 2–3-secta lobulis parvis insignis; flores coerulei, in scapis radicalibus singuli.

Herba polycarpica, acaulis. *Folia* radicalia, conferta, glabra vel parce pilis simplicibus induta, lamina ovato-lanceolata, 2–3-jugim pinnatisecta, 2·5–5 cm. longa, 1–1·5 cm. lata, lobulis 5 mm. longis, 3 mm. latis; petiolus 3·5–6 cm. longus versus basin parum vaginatus. *Flores* numerosi in pedunculis simplicibus 3·5–8 cm. longissinguli. *Sepala* 2, ovata, 1·5 cm. longa, 9 mm. lata, glabra. *Petala* 4, raro 5, coerulea, ovato-rotundata, 3 cm. longa, 2·75 cm. lata. *Stamina* indefinita, pluriseriata; filamenta filiformia, glabra, discreta, intense coerulea, antheris oblongis aureis. *Ovarium* e carpellis 5–6 compositum, parce setosum, oblongum, 5 mm. longum, stylo 3 mm. longo glabro; placentae intrusae; ovula numerosa. *Capsula* matura subpyriformis, 1·5 cm. longa.

Meconopsis bella, the smallest species of the genus, was first met with in two localities on the eastern frontier of Nepal by a Lepcha collector employed by Sir George King in July, 1888. Seeds obtained that year were sent to various alpine gardens in Europe from the Royal Botanic Garden, Calcutta, but none of the recipients appear to have succeeded in raising plants. The species was not met with again for several years; nor was it rediscovered till a special search was made in the original localities, Peykiongla, in Jongri, just within Western Sikkim, and Nyegu, just across the Nepalese frontier, at from 12,000 to 14,000 ft. above sea-level. Since 1898 repeated attempts have been made to introduce the species to European horticulture. These have at last been successful, and plants raised from seed collected on the Nepalese frontier in 1903, and distributed from the Calcutta garden, flowered in the Royal Botanic Garden, Edinburgh, in August, 1906. The figure now given is based on one of these plants, presented to Kew by Professor Bayley Balfour.

April 1st, 1907.

The species, so far as is known, is confined to a very circumscribed area, though it is possible that it may extend westward from the localities where it has been found into the forbidden territory of Alpine Nepal. It has as yet only been met with in the places where it was originally found; even there it is extremely local, and is confined to spots where there are vertical cliffs into the clefts of which its stout rootstocks push horizontally, the rosette of much-cut *Corydalis*-like leaves being closely applied to the face of the rock. The rocks which it affects are moist, but it is not met with in places that are exposed to direct rain.

In cultivation at Edinburgh the rosette of leaves has persisted during the winter months. The contrast between the golden-yellow anthers and the dark blue filaments is the most striking feature in the flowers of this species.

Descr.—A perennial, almost glabrous herb; rootstock stout, fusiform, the neck clothed with leaf-sheaths. *Leaves* many, radical, 2–4 in. long, 2–3-jugately pinnatisect, with small, ovate-oblong segments, the petiole 1–2½ in. long, somewhat sheathing towards the base. *Flowers* numerous, on simple 1-flowered scapes 1½–3 in. long. *Sepals* 2, ovate, ½ in. long, glabrous. *Petals* 4, or casually 5, pale blue, wide ovate, 1¾ in. long, 1½ in. across. *Stamens* numerous, several seriate, the filaments slender, distinct, deep blue. *Ovary* 5–6-carpelled, usually sparingly setose, oblong, ¼ in. long; style short but distinct; placentas intruded; ovules many. *Capsule*, when ripe, somewhat pyriform, ¾ in. long; seeds small, finely reticulated.—D. Prain.

Figs. 1 and 2, stamens; 3, pistil:—*all enlarged.*

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W. Fitch del. et lith.

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Tab. 8131.

CYMBIDIUM ERYTHROSTYLUM.

Annam.

ORCHIDACEAE. Tribe VANDEAE.

CYMBIDIUM, *Swartz*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 536.

Cymbidium erythrostylum, *Rolfe in Gard. Chron.* 1905, vol. xxxviii. p. 427; 1906, vol. xl. p. 286, fig. 115; *Orch. Rev.* 1906, p. 39; a *C. Parishii*, Reichb. f., inflorescentiae vaginis angustioribus, sepalis petalisque latioribus, labello latius apice subaequaliter trilobo et columna sanguinea differt.

Herba epiphytica, circa 45 cm. alta. *Pseudobulbi* fasciculati, ovato-oblongi, compressi, circa 2·5 cm. longi, basi polyphylli, apice monophylli. *Folia* arcuata, elongato-linearia, 25–38 cm. longa, circa 1·3 cm. lata, basi vaginata. *Scapi* axillares, suberecti, 30–40 cm. longi, vaginis lanceolatis acutis obtecti, 4–5-flori. *Bracteae* lanceolatae, acuminatae, 2–4 cm. longae. *Pedicelli* 3–4·5 cm. longi. *Sepala* elliptica, apiculata, concava, 4·5 cm. longa, 2·5 cm. lata, alba, lateralia paullo carinata. *Petala* obovato-elliptica, apiculata, sepalis paullo breviora, alba, basi minute purpureo-punctata. *Labellum* late obovatum, apice trilobum, circa 4 cm. longum et latum, basi attenuatum; lobi laterales obtuse rotundati; lobus intermedius brevis, latus, obtusus, pallide flavus, purpureo-venosus, margine purpureo-punctatus; discus quinque-carinatus, venis villosis, medio in callum tridentatum incrassatus. *Columna* clavata, arcuata, 2·5 cm. longa, sanguinea.

This graceful and beautiful species is a native of Annam, and was discovered and sent home by Mr. W. Micholitz, when collecting there for Messrs. Sander & Sons in 1891. It flowered for the first time in cultivation in the Royal Botanic Garden, Glasnevin, in November, 1905, when it was sent to Kew for determination, and the annexed plate was prepared. About a year later it flowered in several other collections, and thus is evidently a winter-blooming species. Its general habit and few-flowered inflorescence place it near to the North Indian *C. eburneum*, Lindl. (Bot. Mag. t. 5126), and the Burmese *C. Parishii*, Reichb. f., but it is markedly different in the structure and details of the lip, while its crimson column is unique in the genus, and furnished a very appropriate specific name. In its slender habit it somewhat recalls the allied *Cyperorchis elegans*, Blume (Bot. Mag. t. 7007), but the inflorescence is very different.

Descr.—An erect epiphytic herb, about $1\frac{1}{2}$ ft. high.

Pseudobulbs ovate-oblong, over an inch long, several-leaved. *Leaves* arching, elongate-linear, acute, 10–15 in. long, about $\frac{1}{2}$ in. broad, sheathed at the base. *Scape* axillary, suberect, arching, 1–$1\frac{1}{2}$ ft. long, 4–5-flowered, with several narrowly lanceolate acuminate sheaths below. *Bracts* lanceolate, acute, 1–$1\frac{1}{2}$ in. long. *Pedicels* $1\frac{1}{4}$–$1\frac{3}{4}$ in. long. *Sepals* elliptical, apiculate, concave, $1\frac{3}{4}$ in. long, about 1 in. broad, white, the lateral pair somewhat keeled behind. *Petals* obovate-elliptical, apiculate, rather shorter than the sepals, white, with about three rows of minute purple dots down the centre of the basal half. *Lip* broadly obovate, 3-lobed at the apex, as long as the petals, $1\frac{1}{2}$ in. broad at the apex, much narrowed towards the base; side lobes obtusely rounded; front lobe short, broad and obtuse; colour yellowish white, rather deeper towards the apex, and lined throughout with red-purple, the lines breaking up into dots at the margin of the side lobes; veins more or less thickened, and somewhat villous on the disk and front lobe; disk with five slender keels, thickened about the middle into a prominent 3-lobed crest, the middle lobe exceeding the lateral pair. *Column* clavate, arcuate, an inch long, and wholly crimson in colour. *Pollinia* four, more or less confluent into two, and attached by a short, broad stipes to a hippocrepiform gland.—R. A. Rolfe.

Fig. 1, part of the lip; 2, column; 3 and 4, pollinarium seen from back and front; 5, whole plant:—5, *much reduced, the rest enlarged.*

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Tab. 8132.

CAESALPINIA VERNALIS.

China.

LEGUMINOSAE. Tribe CAESALPINIEAE.

CAESALPINIA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 565.

Caesalpinia vernalis, *Champ. ex Benth. in Hook. Kew Journ.* 1852, vol. iv. p. 77; *Benth., Fl. Hongk.* p. 97; *Hemsl. in Journ. Linn. Soc. Bot.* vol. xxiii. p. 206; affinis *C. Nugae,* Ait., a qua foliolis minoribus ovatis et racemis ferrugineo-tomentosis differt.

Frutex alte scandens, caule sparse aculeato, cortice longitudinaliter desquamante. *Ramuli* et foliorum rhaches juvenes brunneo-tomentelli, innovationibus ferrugineo-tomentosis. *Rhachis folii* subtus valde aculeata; pinnae 9–12-jugae, breviter petiolatae, rhachiola inter foliola aculeolata; foliola 4–8-juga, breviter petiolulata, ovata, acuta, interdum leviter acuminata, 1·5–2·5 cm. longa, 0·5–1 cm. lata, supra nitidula, glabra, subtus pallida nervo medio puberulo. *Racemi* in axillis superioribus orti, circ. 15 cm. longi, rhachi ferrugineo-tomentosa. *Alabastra* nutantia. *Sepala* obovato-oblonga, convexa, ciliata, anticum quam cetera majus, extra longiuscule ferrugineo-pubescens, vix 1 cm. longum. *Petala* ovata, lateralia et antica vix 1·5 cm. longa ungue incluso, posticum quam cetera minus, reflexum vel revolutum, coccineo-maculatum. *Stamina* declinata, filamentis inferne villosis, antheris uni- vel biapiculatis. *Ovarium* breviter stipitatum, pubescens, biovulatum, stylo crasso. *Legumen* oblique elliptico-oblongum, 5 cm. longum, 3·5 cm. latum.

Caesalpinia vernalis attaches itself to the trees on which it climbs by means of the numerous backwardly-directed prickles on the under surface of the leaf-rhachis. It has hitherto been recorded only from Hongkong, but may possibly yet be found on the mainland; according to Mr. W. J. Tutcher, Assistant Superintendent, Botanic Garden, Hongkong, of the 159 species recorded as endemic for Hongkong by Bentham, only about 50 remain peculiar to the island, the remainder having since been discovered in other parts of China. Numerous additional species have been discovered in Hongkong since the publication of the "Flora Hongkongensis," and the endemic element is now estimated by Tutcher (Journ. Linn. Soc. Bot., vol. xxvii. p. 59) at about 100.

Seeds of *C. vernalis* were received at Kew in 1883 from the Botanic Gardens, Hongkong, but the species did not flower until May, 1906, when it was figured for this Magazine. The Kew plant is trained against one of the pillars in the Temperate House, where it has made

vigorous growth. The rusty tomentum on the younger parts gives the plant a very characteristic appearance; and the flowers, which are lemon-yellow with a scarlet blotch, have a singularly pleasing effect.

Descr.—A tall, climbing, prickly shrub, the younger shoots with a rusty-brown coating of hairs. *Leaves* bipinnate, with 9–12 pairs of pinnules; rhachis armed on the lower surface with numerous recurved prickles; leaflets 4–8 pairs on each pinnule, ovate, acute, $\frac{1}{2}$–1 in. long, $\frac{1}{6}$–$\frac{1}{2}$ in. broad, slightly shining and quite glabrous on the upper surface, dull and much paler on the lower; midrib puberulous on the lower surface. *Racemes* about 6 in. long, borne in the upper axils; rhachis rusty-tomentose. *Sepals* obovate-oblong, ciliate, the lowermost one larger than the others, and rusty-pubescent on the back. *Petals* ovate, lemon-yellow, the uppermost one smaller than the others, reflexed or revolute, and marked with a scarlet blotch. *Stamens* declinate; filaments villous in their lower half. *Ovary* shortly stipitate, pubescent, two-ovuled; style stout. *Pod* obliquely elliptic-oblong.—T. A. Sprague.

Fig. 1, flower with lateral and anticous petals removed; 2 and 3, anthers; 4, pistil:—*all enlarged.*

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Tab. 8133.

× ODONTIODA HEATONENSIS.

Garden Hybrid.

ORCHIDACEAE. Tribe VANDEAE.

ODONTIODA, *genus inter Cochliodam et Odontoglossum hybridum.*

Odontioda heatonensis, *Gard. Chron.* 1906, vol. xxxix. p. 158; *Orch. Rev.* 1906, p. 118; inter *Cochliadam sanguineam* et *Odontoglossum cirrhosum* hybrida.

Herba epiphytica, circa 25–30 cm. alta. *Pseudobulbi* ovoideo-oblongi, subcompressi, apice monophylli, basi 3–4-phylli, 4–5·5 cm. longi. *Folia* oblonga, subacuta, apice recurva, subcoriacea, 6–15 cm. longa, 2–5 cm. lata. *Scapi* axillares, erecti, circa 30 cm. longi; racemi laxi, multiflori. *Bracteae* ovato-oblongae, acutae, 4–5 mm. longae. *Pedicelli* 2–2·5 cm. longi. *Flores* speciosi, candidi, segmentis apice roseo-suffusis, basi roseo-maculatis. *Sepala* oblongo-lanceolata, acuminata, 2–2·5 cm. longa. *Petala* oblongo-lanceolata, acuminata, sepalis paullo breviora et latiora. *Labellum* liberum, late unguiculatum; limbus patens, subtrilobus, ovatus, apice acuminatus et recurvus, 1·5–2 cm. longus; discus bicristatus, cristis late oblongis compressis et bidentatis. *Columna* clavata, fere 1 cm. longa, alis subulatis.

About three years ago a hybrid was raised between *Odontoglossum nobile*, Reichb. f., and *Cochlioda Noetzliana*, Rolfe, to which the generic name of *Odontioda* was given, and the plant was figured in this Magazine (t. 7990). Since that time three other members of this artificial genus have appeared, one of which is figured in the accompanying plate. It was raised by Messrs. Charlesworth & Co., Heaton, Bradford, from *Odontoglossum cirrhosum*, Lindl. (B. M. t. 6317), and *Cochlioda sanguinea*, Benth. (*Mesospinidium sanguineum*, Reichb. f.. B. M. t. 5627), the former being the seed-bearer, and flowered for the first time in March, 1906, when it was exhibited at a meeting of the Royal Horticultural Society, and received an Award of Merit. Several seedlings have flowered, and, as generally happens with hybrids, show a certain amount of variation in size and colour. One of the plants has been presented to the Kew collection.

The two other *Odontiodae* are *O. Bohnhoffiae*, a hybrid between *Cochlioda vulcanica*, Benth. et Hook. f. (*Mesospinidium vulcanicum*, Reichb. f.; B. M. t. 6001), and *Odontoglossum cirrhosum*, Lindl., and *O. Bradshawiae*, derived from *Cochlioda Noetzliana*, Rolfe, and *Odontoglossum*

crispum, Lindl. Both were raised by Messrs. Charlesworth & Co. Other seedlings are in existence, and the group is likely to extend considerably, as the union of the smaller-flowered but brilliantly-coloured species of *Cochlioda* with the popular species of *Odontoglossum* promises to yield a race of handsome garden Orchids.

Descr.—Plant about a foot high. *Bulbs* ovoid-oblong, somewhat compressed, 2–2¼ in. long, with one leaf at the apex, and three or four at the base. *Leaves* oblong, subacute, recurved at the apex, leathery, dark green, 3½–6 in. long, ½–1 in. broad. *Scape* axillary, erect, slender, 1 ft. or more high; raceme loose and many-flowered. *Bracts* ovate-oblong, acute, under ¼ in. long. *Pedicels* about 1 in. long. *Flowers* with a white ground, suffused at the apex of the segments, and spotted below with rosy purple. *Sepals* oblong-lanceolate, acuminate, about 1 in. long. *Petals* slightly shorter, and broader at the base than the sepals. *Lip* free, broadly stalked; limb spreading, slightly 3-lobed, ovate, acuminate and recurved at the apex, shorter than the other segments; disc with a pair of erect oblong laterally compressed crests, slightly toothed at the apex. *Column* clavate, under ½ in. long, with a pair of erect, subulate teeth at the apex.—R. A. Rolfe.

Fig. 1, lip and column; 2 and 3, pollinarium:—*all enlarged.*

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Tab. 8134.

ALOE CAMPYLOSIPHON.

Tropical Africa.

LILIACEAE. Tribe ALOINEAE.

ALOE, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 776; *A. Berger in Engl. Bot. Jahrb.* vol. xxxvi. p. 42.

Aloe campylosiphon, *A. Berger in Notizbl. Königl. Bot. Gart. Berl.* vol. iv. p. 151; *Engl. Bot. Jahrb.* vol. xxxvi. p. 59; *A. saponariae,* Haw., proximas, foliis recurvatis lanceolatis differt.

Acaulis. *Folia* circ. 15, dense rosulata, lanceolata, longe acuminata, recurvata, apice subcarinata, circ. 12 cm. longa, basi 6 cm. lata, laete viridia maculis oblongis rotundisve albidis picta, subtus albo-marmorata; margines cartilaginei, purpurei, sinuato-dentati; dentes patentes, inter se 4–8 mm. distantes, purpurei, 2–3 mm. longi. *Inflorescentia* circ. 30 cm. alta, ramosa; racemus 10 cm. longus, densiflorus; bracteae 1–2 cm. longae, lanceolatae, acuminatae, scariosae, 3–5-nerviae; pedicelli erecto-patentes, per anthesin 1·5 cm. longi. *Perianthium* 3 cm. longum, coralli-num; tubus circa ovarium globoso-inflatus deinde conspicue constrictus et manifeste decurvatus; lobi oblongi, subacuti, 1 cm. longi, ad margines pallidiores, intus lutei. *Filamenta* perianthio paullo longiora, basi complanata; antherae lineares, aurantiacae, dorsifixae. *Ovarium* oblongum, profunde trilobatum.

Aloe campylosiphon was discovered by Dr. A. Engler in Usambara, amongst rocks, on the dry summit of Bomule Mountain, at an altitude of 3,450 ft., and introduced into cultivation by him in 1902. He sent a plant to the late Sir Thomas Hanbury, K.C.V.O., in whose garden at La Mortola it first flowered in June, 1905, it was from this plant, at its second flowering in June, 1906, that our figure was taken. Mr. A. Berger writes: "It somewhat resembles the old *A. saponaria*, but differs in every way, and is a very distinct species."

In habit this species very strongly resembles *A. somaliensis*, C. H. Wright (ex W. Watson in Gard. Chron. 1899, vol. xxvi. p. 430; Kew Bulletin, 1901, p. 135), but the perianth of the latter is not constricted above the ovary.

Descr.—Stemless. Leaves about 15 in a dense rosette, lanceolate, long-acuminate, recurved, slightly keeled at the apex, about $4\frac{3}{4}$ in. long, $2\frac{1}{2}$ in. wide at the base, bright green, and marked with oblong or round whitish spots above, marbled with white beneath; margins cartilaginous, purple, wavy and toothed; teeth standing out at right

angles to the margin, $\frac{1}{6}$–$\frac{1}{2}$ in. apart, purple, about $1\frac{1}{2}$ in. long. *Inflorescence* about 1 foot high, or slightly more; side branches 8 in. long, curved upwards; raceme 4 in. long, dense; bracts $\frac{1}{3}$–$\frac{3}{4}$ in. long, lanceolate, acuminate, scarious, 3–5-nerved; pedicels $\frac{2}{3}$ in. long, becoming $1\frac{1}{4}$ in. long in fruit. *Perianth* a little over 1 in. long, coral-red; tube inflated around the ovary, then conspicuously constricted and curved; lobes oblong, subacute, about $\frac{1}{3}$ in. long, paler at the margins, yellow inside. *Filaments* a little longer than the perianth, flattened at the base; anthers linear, dorsifixed, orange. *Ovary* oblong, deeply three-lobed.—C. H. Wright.

Fig. 1, flower; 2 and 3, stamens; 4, pistil; 5, whole plant:—1–4, *enlarged*, 5, *much reduced*.

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Tab. 8135.

PRIMULA ORBICULARIS.

China.

PRIMULACEAE. Tribe PRIMULEAE.

PRIMULA, *L.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 631.

Primula (§ Nivales, *Pax*) **orbicularis,** *Hemsl. in Gard. Chron.* 1906, vol. xxxix. pp. 290 et 403, f. 164; species ex affinitate *P. sikkimensis* et *P. Stuartii* a quibus foliis fere integris, corollae tubo calycem vix excedente et limbo rotato lobis integerrimis differt.

Folia subcoriacea, oblongo-lanceolata, 5–15 cm. longa, inferiora minora, obtusa, longitudinaliter recurva, minute dentata, in petiolum late alatum subvaginantem angustata, primum minute farinosa. *Scapus* 15–30 cm. altus, teres, ac flores flavo- vel albo-farinosus. *Involucri bracteae* parvae, pedicellis breviores, basi incrassatae, connatae. *Umbellae* usque ad 20-florae. densae, 7–8 cm. diametro, pedicellis brevibus. *Flores* 2·5–3 cm. diametro, lutei, fragrantes. *Calyx* crassus, campanulatus, circiter 1·5 cm. longus, intus extraque farinosus. *Corollae* hypocraterimorphae tubus puberulus, calycem vix excedens, prope apicem et infra medium ad staminum insertionem constrictus, fauce angusta, crenulata; limbus per totam superficiem puberulus, orbicularis, rotatus, planus, lobis fere orbicularibus leviter imbricatis integerrimis margine ciliolatis. *Stamina* ad tubi constrictionem infra medium affixa, filamentis brevissimis, antheris circiter 2 mm. longis. *Stylus* inclusus, stamina superans. *Capsula* **mihi ignota.**

Among the numerous new species of *Primula* from Western China *P. orbicularis* promises well, but it is too early to predict its future under cultivation. This species was raised by Messrs. James Veitch & Sons from seed brought home by Mr. E. H. Wilson, and it flowered for the first time last May. Mr. Wilson did not collect flowering specimens, but he was almost satisfied that his dried specimens in seed, numbered 3003A, represent the same species. He may be right, though they present differences which lead to a doubt as to the identification. In the first place they are more robust than the cultivated plants that I have seen. The leaves are 6 to 8 in. long, and have a distinct petiole, nearly as long as the blade, and the stout scape is 15 in. high, and bears two distinct tiers of seed-vessels. The pretty flowers of *P. orbicularis* are agreeably fragrant. The name is given in reference to the outline of the limb of the corolla, as well as of the separate lobes of the same.

Descr.—A more or less mealy perennial. *Leaves* thick,

leathery or somewhat fleshy, oblong-lanceolate, 2–8 in. long, obtuse, margins recurved, minutely toothed or entire, narrowed downwards into a sheathing petiole. *Scape* 6 in. to a foot high, terete. *Bracts* of the involucre small, shorter than the pedicels, thickened and connate at the base. *Umbels* dense, 10–20-flowered, $2\frac{1}{2}$-3 in. in diameter; pedicels short. *Flowers* 1–$1\frac{1}{4}$ in. in diameter, clear yellow, agreeably fragrant. *Calyx* thick, campanulate. *Corolla* salver-shaped, puberulous; tube scarcely longer than the calyx, constricted near the top and below the middle, where the stamens are attached; mouth narrow, crenulated; limb orbicular, rotate, flat, with almost orbicular, slightly overlapping, entire, minutely ciliated lobes. *Stamens* attached below the middle of the corolla-tube; filaments very short. *Style* included, but overtopping the stamens. *Capsule* not seen.—W. Botting Hemsley.

Fig. 1, part of calyx and pistil; 2, part of corolla laid open and three of the stamens:—*both enlarged.*

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M.S. del. J.N. Fitch lith.

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Tab. 8136.

HOODIA Currori.

Angola.

Asclepiadaceae. Tribe Stapelieae.

Hoodia, *Sweet*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 783.

Hoodia Currori, *Decne in DC. Prodr.* vol. viii. p. 665; *Hooker, Niger Fl.* p. 458; *Dyer in Journ. Linn. Soc.* vol. xv. p. 251, t. 5, f. 2; *N. E. Br. in Hook. Ic. Pl.* vol. xx. sub t. 1905, p. 3; *K. Schum. in Engl. & Prantl Pflanzenfam.* vol. iv. pt. ii. p. 275; *N. E. Br. in Fl. Trop. Afr.* vol. iv. pt. i. p. 491; *Gard. Chron.* 1906, vol. xl. p. 62, f. 27; affinis *H. Gordoni*, sed corolla majore intra pilosa facile distinguitur.

Planta succulenta 45–60 cm. alta, basi ramosa, glauco-virens. *Rami* erecti, 4·5–6·5 cm. crassi, multiangulati, glabri; angulis spinoso-tuberculatis. *Flores* magni, prope apicem ramorum enati. *Pedicelli* 1·8–2 cm. longi. *Sepala* 6–8 mm. longa, e basi ovata subulato-attenuata. *Corolla* 9–12·5 cm. diam., patelliformis, vix lobata, 5-cuspidata, purpureo-rubra disco radiato-ochracea, intra purpureo-pilosa; tubus 6 mm. longus, 8 mm. diam., circa orem leviter 5-tuberculatus. *Corona exterior* cupularis, 5-sulcata, 10-dentata, glabra, purpureo-brunnea, dentibus deltoideis obtusis, 1 mm. longis. *Coronae interioris* lobi fere 1 mm. longi, oblongo-lineari, obtusi, antheris incumbentes, basi partitionibus cum corona exteriore connexi, purpureo-brunnei.—*Scytanthus Currori*, Hook. Ic. Pl. vol. vii. tt. 605-606; *S. Burkei*, Hook. Ic. Pl. vol. vii. sub t. 625. *Adenium namaquarium*, Henslow in The Gardener, 1901, p. 1194, f. 16.

This is the third out of the six described species of this remarkable genus that has flowered at Kew and been figured in the Botanical Magazine, the other two being *H. Gordoni* (t. 6228), and *H. Bainii* (t. 6348), whilst, so far as is known to me, no other specimens are recorded as having flowered in any part of the world outside their native country. In its stems *H. Currori* differs very little from *H. Gordoni* and some of the other species, but its flowers are larger than those of any other, and more hairy on the inner surface; they are also more richly coloured than in the other two species which have flowered at Kew. The specimen here figured was sent to Kew, in 1905, from Angola, by Mr. J. Gossweiler, Curator of the Botanic Garden at Loanda. At first it was subjected to dry treatment, but as this failed to induce active growth, it was placed in a moist stove, where it throve and flowered in June, 1906, the flowers lasting for about fifteen days.

May 1st, 1907.

Descr.—A bushy, succulent perennial, 2–2½ ft. high. *Stems* 1¾–2½ in. thick, cylindric, with thirteen or more angles formed of contiguous spine-tipped tubercles, glabrous, pale glaucous-green. *Flowers* arising in the grooves near the top of the stems, two to four (or more?) together, successively developed. *Pedicels* ¾ in. long, ⅛ in. thick, glabrous, purple-tinted. *Sepals* ¼–⅓ in. long, subulate-attenuate from an ovate base, glabrous. *Corolla* 3½–5 in. in diameter, saucer-shaped, obscurely lobed, with five subulate cusps, purplish-red, with ochreous-tinted rays on the central part, glabrous on the back, covered with erect purple hairs all over the inner face; the tube (enclosing the corona) very small, about ¼ in. long, ⅓ in. in diameter outside, raised around the mouth into five dull red or sienna-red tubercles, and the orifice thickly roofed over with intermingling hairs, so that only very minute insects can enter. *Outer corona* exceeding the style-apex by half its length, resembling a five-grooved cup, with five pairs of deltoid, obtuse teeth nearly ½ line long, glabrous, dark purple-brown, shining. *Inner coronal-lobes* nearly ½ line long, oblong-linear, obtuse, closely incumbent on the anthers and not produced beyond them, dorsally connected by partitions with the outer corona, glabrous, dark purple-brown, shining.—N. E. Brown.

Fig. 1, flower with the corolla removed, showing the corona; 2, mouth of the corolla-tube; 3, pollen-masses:—*all enlarged.*

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Tab. 8137.

RHODODENDRON Delavayi.

China.

Ericaceae. Tribe Rhodoreae.

Rhododendron, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron Delavayi, *Franch. in Bull. Soc. Bot. France*, 1886, vol. xxxiii. p. 231; *W. W. in Gard. Chron.* 1904, vol. xxxv. p. 262; *R. arboreo* arcte affine et hujus speciei forsan varietas tantum calyce majore hirsuta et corolla intus maculis nigris corollae lobis isomeris ornata.

"*Arbor* [vel *frutex* paucipedalis]. *Folia* coriacea, oblongo-lanceolata, superne glabra, viridi-glaucescentia, subtus tomento rufidulo brevissimo obsita, nervis subinconspicuis. *Flores* 15–30, dense congesti, intense rubri. *Calyx* pubescens, parvus, dentibus deltoideis. *Corolla* vix ultra pollicaris e basi aperta campanulata, lobis 5 rotundatis. *Stamina* 10, filamentis glabris. *Ovarium* dense sericeo-villosum, stylo etiam basi glaberrimo." **Franchet, loc. sup. cit.**

Franchet's description is unaccompanied by any comparison with other species, but, as Mr. Watson remarks, *R. Delavayi* is the same in all essential characters as *R. arboreum*, and the latter, as circumscribed in the "Flora of British India," includes forms differing more from each other than the plant here figured does from Smith's original figure in "Exotic Botany," vol. i. t. 6, of *R. arboreum*. Still, as a cultivated plant, it deserves a distinctive name, and as it has one it is retained here. *R. Delavayi*, which is distinguished by the intense red of its flowers with black blotches on the inside, has been in cultivation in Europe nearly twenty years, and at Kew previous to 1894, where, however, it has never flowered. The drawing for the accompanying plate was made from a specimen received, through Mr. Moore, of Glasnevin, from Mr. Thos. Acton, Kilmacurragh, Wicklow, where it first flowered in 1904. A plant was sent from Kew to Mr. Acton in 1894, and it is now a large bush, producing its very showy flowers in profusion. Kew possesses dried specimens from Tsangshan, Yunnan, from an elevation of upwards of 8,000 ft., collected by the Abbé Delavay; from Mengtze, at 6,200 ft., collected by Mr. W. Hancock, and from the same region, collected by Dr. A. Henry at elevations of 6,000 to 8,000 ft. It grows in woods and in

open, exposed situations and forms a bush 6–10 ft. high. Some particulars of the genus *Rhododendron* are given under *R. Fordii*, Hemsl. (B. M. t. 8111), especially in relation to the Chinese species.

Descr.—A bush, or small tree, with thick flowering-branches, at first clothed with a red-brown tomentum; bark of the same colour. *Leaves* crowded at the tips of the branches, distinctly stalked, very thick and stiff, oblong or lanceolate, 3–6 in. long, subacute or rounded at both ends, glabrous and shining above, clothed with a very short, pale brown, felt-like indumentum below; mid-rib and main lateral veins impressed above, elevated below; ultimate veinlets obscure; stalks $\frac{1}{3}$–1 in. long. *Scales* of the inflorescence thick, rounded, apiculate, at first clothed with red-brown, silky hairs. *Flowers* crimson, in dense stalkless clusters close on to the leaves, $1\frac{1}{2}$–$1\frac{3}{4}$ in. diameter. *Stamens* and style included. *Capsule* cylindrical, $\frac{3}{4}$ in. long, clothed with a red-brown tomentum.—W. Botting Hemsley.

Figs. 1 and 2, scales of the inflorescence; 3, calyx and pistil; 4 and 5, stamens, 6, cross section of ovary:—*all enlarged.*

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TAMARIX PENTANDRA.

South-eastern Europe and Orient.

Tamaricaceae. Tribe Tamariceae.
Tamarix, *L.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 160.

Tamarix pentandra, *Pall. Flor. Ross.* vol. ii. p. 72, tab. 79, figs. A-D. (excl. synonymis et varietate); a *T. gallica*, L., quacum olim confusa, petalis persistentibus conniventibus et filamentis inter lobos disci ortis basi haud latioribus distincta.

Frutex vel *arbor* ramosissimus; rami cortice plerumque purpurascente tecti, graciles, ramulos tenues longiores laxe foliatos et ex iis alios breviores densissime foliatos emittentes. *Folia* ramorum longiorum lanceolata vel ovato-lanceolata, acuta, basi breviter decurrentia, 2, rarius 3 mm. longa, ramulorum breviorum squamiformia, imbricata, ovata, 0·5–0·65 mm. longa, appressa, glauco-viridia. *Racemi* graciles, densiusculi, 2·5–5 cm. longi, e ramis hornotinis orti, in paniculas amplas terminales dispositi, alii inter ramos steriles additi; bracteae ovatae, acuminatae vel acutae, pedicellos subaequantes vel paulo superantes; pedicelli longiores vix 1 mm. longi. *Sepala* 5, late ovata, acuta, ad margines late albo-hyalina, 0·5–0·6 mm. longa. *Petala* 5, late elliptico-oblonga, obtusissima, campanulatim conniventia, persistentia, 1·5–1·75 mm. longa. *Discus* 5-lobus, lobis emarginatis, sinubus extra ad medium decurrentibus intra multo minus profundis, ideoque discus ex interno visus aequaliter leviter 10-crenatus. *Stamina* 5; filamenta sinubus extra inserta, 2 mm. paulo excedentia, e basi aequaliter filiformia; antherae minute apiculatae, 0·5 mm. longae. *Ovarium* sublageniforme, sub anthesi vix 2 mm. longum; styli 3, plerumque oblique patuli, brevissimi, apice incurvi, stigmatibus obovatis conniventibus; ovula circiter 30. *Capsula* 4 mm. longa, valvis basi fere 1·5 mm. latis. *T. Pallasii*, Desv. in Ann. Sc. Nat. sér. I. vol. iv. (1825), p. 349; DC. Prodr. vol. iii. p. 96; Bunge, Tent. Gen. Tamar. p. 49; Boiss. Fl. Or. vol. i. p. 773 (in parte); Gard. Chron. ser. III. vol. xxxviii. p. 229.

This is one of the most decorative Tamarisks in cultivation, flowering in great profusion in July and August. In the wild state it ranges from the Balkan Peninsula through Southern Russia to Turkestan, and from Asia Minor to Persia, adorning the banks of rivers, particularly in their lower reaches and estuaries. Like other species of that genus it thrives well in saline soil; but it is by no means dependent on a more than ordinary amount of salts in the ground. The flowers are usually rose-coloured; sometimes, however, also white, or nearly so. Bunge described no fewer than eight varieties of *T. Pallasii* in his monograph, and Boissier added one more. Most of them are based on slight, and possibly inconstant, modifications of the inflorescences, whilst one or two represent evidently

distinct species. The genus requires careful revision, and until this is accomplished it is impossible to define accurately the limits and the area of the species. There is no doubt that our plant is the common South Russian form, the "arbor vulgaris" which Pallas described so well as the type of his *T. pentandra*. The reason why Desvaux dropped Pallas's name was probably that author's faulty synonymy, and the inclusion as a variety of another form which he rightly considered a distinct species. Desvaux's own description of "*T. Pallasii*" is practically useless, and to show how little he grasped the characters of Pallas's plants, it may be mentioned that the specimen which he wrote up as "*T. Pallasii*" in the Paris Herbarium (Herb. Jussieu) is *T. laxa*, Willd., a totally distinct species. The variety referred to above as described by Pallas is identical with *T. hispida*, Willd., a singular form with very glaucous, minutely hirsute branchlets. It was under this name that the Kew specimens of *T. pentandra* were purchased from a Belgian nurseryman. The true *T. hispida* is a native of the deserts between the Caspian and Turkestan.

Descr.—A shrub, or small tree, with slender, usually purple branches; this year's branchlets, either long shoots or short shoots. *Leaves* of the long shoots distant, lanceolate to ovate-lanceolate, acute, slightly decurrent at the base, $\frac{1}{12}$–$\frac{1}{8}$ in. long; those of the short shoots imbricate, ovate, $\frac{1}{48}$–$\frac{1}{36}$ in. long, appressed, glaucous or pale green. *Racemes* slender, rather dense, 1–2 in. long, from the new wood, arranged in large, terminal panicles; bracts ovate, acuminate, or acute, as long as, or slightly longer than the pedicels; pedicels up to almost $\frac{1}{24}$ in. long. *Sepals* 5, broad-ovate, acute, $\frac{1}{48}$–$\frac{1}{40}$ in. long, margins broad, hyaline, white. *Petals* 5, broadly elliptic-oblong, very obtuse, conniving, persistent, $\frac{1}{16}$–$\frac{1}{14}$ in. long. *Discus* 5-lobed, lobes emarginate. *Stamens* 5; filaments filiform from the base, inserted on the outer side of the disc between the lobes; anthers minutely apiculate. *Ovary* almost lageniform, $\frac{1}{12}$ in. long; styles 3, very short, with obovate, conniving stigmas. *Capsule* $\frac{1}{6}$ in. long.—Otto Stapf.

Fig. 1, foliage; 2, flowers; 3, flower with sepals and petals removed; 4, section of ovary; 5, ovule:—*all enlarged.*

M.S. del. J.N. Fitch. Lith.

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Tab. 8139.

EUPATORIUM GLANDULOSUM.

Mexico.

COMPOSITAE. Tribe EUPATORIACEAE.

EUPATORIUM, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 245.

Eupatorium glandulosum, *H.B.K. Nov. Gen. et Sp.* 1820, vol. iv. p. 122, t. 346; *Bot. Reg.* 1835, vol. xx. t. 1723; *Paxt. Bot. Dict.* ed. 1, 1840, p. 128; non Michx.; inter species hortenses foliis rhombeo-ovatis vel triangularibus grosse crenato-serratis distincta.

Suffrutex 1–2 m. altus, dense trichotomo-ramosus, ramis graciliusculis glanduloso-pubescentibus, floriferis elongatis subnudis. *Folia* opposita, tenuia, papyracea, longe graciliterque petiolata, rhombeo-ovata vel fere triangularia, in cultis cum petiolo usque ad 20 cm. longa, superne gradatim minora, acuminata, acuta, subtrinervia, grosse serrato-crenata, supra glabra vel cito glabrescentia, subtus praesertim secus costam venasque viscoso-pubescentia. *Corymbi* compositi, ternati et subternatim ramosi, polycephali, densi, pedunculis gracillimis. *Capitula* circiter 1 cm. diametro, saltem usque ad 80-flora. *Involucri bracteae* circiter 20, biseriatae, inaequales, lanceolatae, acutae, quam flores paulo breviores, distincte bicostatae, margine scariosae. *Flores* albi, fragrantes. *Corollae tubus* 4–5 mm. longus, gracillimus, prope apicem subito ampliatus, lobis angustis recurvis. *Styli rami* elongati, longe exserti, divergentes. *Achaenia* 1·5–2 mm. longa, nigra, glabra, 4-angularia, estriata, leviter curvata. *Pappi setae* circiter 10–12, pubescentes, albae, corollae tubum aequantes.—*E. adenophorum*, Spreng. Syst. Veg. 1826, vol. iii. p. 420; DC. Prodr. vol. v. p. 164; Lowe, Man. Fl. Madeira, i. p. 435. *E. trapezoideum*, Kunth, Ind. Sem. Hort. Berol. Anno, 1847, coll. p. 13; Rolfe in Gard. Chron. 1906, vol. xxxix. p. 274. *E. Wendlandii*, Hort.

Eupatorium glandulosum, one of the best of the white-flowered, greenhouse species, was introduced, according to Paxton, in 1826, and it was figured in the "Botanical Register" (t. 1723) in 1835. It is there recorded that the Horticultural Society received seeds from Mexico some years previously through a Mr. Canning. Subsequently, "scarcely before 1840," it was introduced into Madeira and the Canaries, where it is now excessively common. It is a valuable winter plant for the conservatory or greenhouse where there is plenty of space. The drawing was made from a plant that flowered at Kew in March, 1906. In its native country it grows in humid situations at altitudes of 5,000–8,000 ft.

In spite of discrepancies in the description, I think there is no doubt that *E. trapezoideum*, Kunth, belongs here.

Descr.—A much-branched shrub, rising sometimes under

cultivation to a height of 6–8 ft. *Branches* and panicles trichotomous, densely beset with viscous glands. *Leaves* opposite, thin, borne on long stalks, more or less triangular, with the stalks as much as 9 in. long, gradually smaller upwards to the inflorescence, acuminate, acute, coarsely serrate-crenate, glabrescent above, hairy and viscous, chiefly along the veins, beneath. *Flower*-heads numerous, corymbose in ternately branched panicles, white, fragrant, about $\frac{1}{2}$ in. across. *Bracts* of the involucre about 20, in two series, lanceolate, acute, a little shorter than the flowers, prominently 2-ribbed, scarious or thin at the margin. *Style-branches* much exserted, divergent. *Achenes* about $\frac{1}{12}$ in. long, black, glabrous, quadrangular. *Pappus* of about 10 or 12, slightly plumose bristles, as long as the corolla-tube.—W. Botting Hemsley.

Fig. 1, a head of flowers; 2, a flower; 3, a bristle of the pappus; 4, anthers; 5, style-branches:—*all enlarged.*

8140

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Tab. 8140.

GENTIANA ornata.

Alpine Central and Eastern Himalaya.

Gentianaceae. Tribe Swertieae.

Gentiana, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 815.

Gentiana ornata, *Wall. Cat.* 4386; *Griseb. Gentian.* p. 277; *DC. Prodr.* vol. ix. p. 110; *Hook. Fl. Brit. India,* vol. iv. p. 116; *Act. Hort. Petrop.* vol. xv. p. 268; affinis *G. ternifoliae,* Franch., a qua ramis brevioribus et floribus minoribus differt.

Herba 13–15 cm. alta. *Caules* e radice plures, glabri. *Folia* linearia vel inferiora fere ovata, peracuta, 1–2 cm. longa, 1·5–3 mm. lata, basi in tubum brevem connata. *Flores* solitarii, terminales. *Calycis tubus* membranaceus, 1 cm. longus, glaber; lobi 5, lineares, acuti, circiter 1 cm. longi, 1–2 mm. lati, sinubus 0·5 mm. latis. *Corolla* caerulea, infundibuliformis, striata, circiter 4·5 cm. longa, fauce 7 mm. diametro; lobi deltoidei, acuti, 8 mm. longi, 4 mm. lati, plicis deltoideis subacutis. *Stamina* inclusa, circa medium tubi inserta; filamenta deorsum leviter dilatata, 1 cm. longa; antherae 3 mm. longae. *Ovarium* glabrum, 1·5 cm. longum, stipitatum; stylus brevis. *Capsula* vix 1·5 cm. longa demum e corolla multo exsertus.—*Pneumonanthe ornata,* Don, Gen. Syst. vol. iv. p. 194.

The plant previously figured at t. 6514 of this Magazine under the name of *G. ornata* is evidently not the true species, as has been pointed out in the "Gardener's Chronicle," 1906, vol. xl. p. 182. It differs from *G. ornata* in having the throat of the corolla much more contracted, and in having broader leaves. Unfortunately no dried material of the specimen figured was preserved, and it has not been identified, but it comes near *G. nipponica,* Maxim. The plant here figured was presented to Kew in 1905 by Mr. Max Leichtlin of Baden-Baden. It flowered freely in a frame in August of last year, but will probably prove to be quite hardy.

This species was first discovered by Wallich's collectors in the Central Himalaya, at an altitude of 11–15,000 ft. It has since been found in the Tsangpo Valley, north of Sikkim, and was recently discovered about ten miles to the north of Lhasa, by Capt. H. J. Walton during the Thibet Expedition.

Several varieties of this plant have been described. One of the most distinct is *G. ornata,* var. *obtusifolia,* Franch., with broader obtuse leaves, and a somewhat longer corolla than in the type; it is found in the country between Batang and Tachienlu in Western China.

June 1st, 1907.

Descr.—A herb about 6 in. high. *Stems* many from the root, glabrous. *Leaves* linear, or the lower almost ovate, very acute, $\frac{1}{2}$–$\frac{3}{4}$ in. long, about $\frac{1}{12}$ in. broad, connate at the base into a short tube. *Flowers* solitary and terminal. *Calyx-tube* membranous, $\frac{1}{2}$ in. long, glabrous, with 5 linear acute lobes about $\frac{1}{2}$ in. long. *Corolla* blue, funnel-shaped, striate, about $1\frac{3}{4}$ in. long and $\frac{1}{4}$ in. in diameter at the throat; lobes deltoid, acute, $\frac{1}{3}$ in. long, $\frac{1}{6}$ in. broad, with subacute, deltoid folds between. *Stamens* included, inserted about the middle of the tube; filaments slightly dilated downwards. *Ovary* glabrous, with a stalk about $\frac{1}{2}$ in. long; style short. *Capsule* about $\frac{1}{2}$ in. long, at length much exserted from the corolla.—J. Hutchinson.

Fig. 1, section of calyx with pistil; 2 section of corolla; 3 and 4, anthers:—*all enlarged.*

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Tab. 8141.

DENDROBIUM Ashworthiae.

New Guinea.

Orchidaceae. Tribe Epidendreae.

Dendrobium, *Swartz*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 498.

Dendrobium Ashworthiae, *O'Brien in Gard. Chron.* 1901, vol. xxix. p. 86, fig. 36; a *D. atroviolaceo*, Rolfe, floribus majoribus, pedicellis apice villosis, segmentis immaculatis et labelli callo suberecto differt.

Herba epiphytica. *Pseudobulbi* 11–25 cm. longi, basi angusti, vaginis subimbricatis obtecti, supra medium clavati, subcompressi, sulcati, 2·5–3 cm. lati, diphylli. *Folia* ovato-oblonga, subobtusa, coriacea, 9–11 cm. longa, 5–6 cm. lata. *Racemi* terminales, erecti, 10–15 cm. longi, basi vaginis tubuloso-spathaceis obtecti, 4–5-flori. *Bracteae* ovatae, subacutae, concavae, 1·5–2 cm. longae. *Pedicelli* graciles, 4–5 cm. longi, basi laeves, apice villosi, pilis retrorsis. *Flores* straminei, labelli basi purpureo-striati. *Sepala* patentia, circa 3 cm. longa; posticum elliptico-lanceolatum, acuminatum; lateralia oblique triangularia, acuminata, basi circa 8 mm. lata. *Petala* late unguiculata, obovata, apiculata, circa 3 cm. longa, 1·5–2 cm. lata. *Labellum* circa 2 cm. longum, trilobum; lobi laterales erecti, latissime oblongi, obtusi, circa 1 cm. longi; lobus intermedius latissime subcordato-ovatus, apiculatus, circa 1 cm. longus; callus suberectus, oblongus, apice obscure tridentatus, 4 mm. longus. *Columna* latissima, circa 4 mm. longa.

The present species was introduced by Messrs. Sander & Sons, St. Albans, through their collector, Mr. W. Micholitz, about seven years ago, and it flowered in the collection of Mr. Elijah Ashworth, Harefield Hall, Wilmslow, in January, 1901, when it received a First-class Certificate from the Royal Horticultural Society. It is said to have been imported with *D. atroviolaceum*, *D. Johnsoniae*, *D. spectabile*, and *D. Madonnae*; this probably fixes its habitat as New Guinea. The plant subsequently died, but there is another in the collection of Sir Trevor Lawrence, Bart., at Burford, which is believed to be the only surviving one in Europe, and this was kindly lent by Sir Trevor in April of last year, in order that it might be drawn for the Botanical Magazine. It belongs to a section of the genus of which five others have been figured in this work, namely, *D. macrophyllum*, A. Rich., var. *Veitchianum*, Hook. f. (t. 5649), *D. atroviolaceum*, Rolfe (t. 7371), *D. Hodgkinsoni*, Rolfe (t. 7724), *D. spectabile*, Miq. (t. 7747), and *D. Madonnae*, Rolfe (t. 7900). They belong to the section *Dendrocoryne*, originally established by

Lindley to contain the species having a clavate pseudobulb bearing leaves only at the apex, and a terminal or lateral inflorescence. The section was not recognized by Bentham and Hooker, but after excluding two or three species now known to belong elsewhere it forms a well-characterized section of *Dendrobium*. The genus is remarkably polymorphic, and is now estimated to contain at least five hundred species, these being distributed from Japan, China, and Northern India to New Zealand.

Descr.—An epiphytic herb about a foot high. *Pseudobulbs* 4–10 in. long, narrow at the base, with several somewhat imbricating sheaths, clavate above, somewhat compressed and sulcate, about 1 in. broad, 2-leaved at the apex. *Leaves* ovate-oblong, subobtuse, coriaceous, $3\frac{1}{2}$–$4\frac{1}{2}$ in. long, about 2 in. broad. *Racemes* terminal, erect, 4–6 in. long, with two or three tubular-spathaceous sheaths at the base, 4–5-flowered. *Bracts* ovate, subacute, somewhat concave, over $\frac{1}{2}$ in. long. *Pedicels* $1\frac{1}{2}$–2 in. long, smooth and slender at the base, upper part and ovary densely villous with reflexed hairs. *Flowers* cream-white, with a few purple streaks at the base of the lip. *Sepals* spreading, about $1\frac{1}{4}$ in. long; the dorsal one elliptic-lanceolate, acuminate; the lateral pair obliquely triangular, acuminate, over $\frac{1}{4}$ in. broad at the base. *Petals* broadly clawed, obovate, apiculate, about as long as the sepals, $\frac{3}{4}$ in. broad. *Lip* $\frac{3}{4}$ in. long, three-lobed; side lobes erect, very broadly oblong, obtuse, over $\frac{1}{3}$ in. long; front lobe very broadly subcordate-ovate, apiculate, over $\frac{1}{3}$ in. long; callus suberect, oblong, obscurely 3-dentate at the apex, $\frac{1}{6}$ in. long. *Column* very broad, $\frac{1}{6}$ in. long.—R. A. Rolfe.

Fig. 1, hairs from ovary; 2, base of lip; 3, column; 4, pollinia; 5, whole plant:—1–4, *all enlarged*, 5, *much reduced*.

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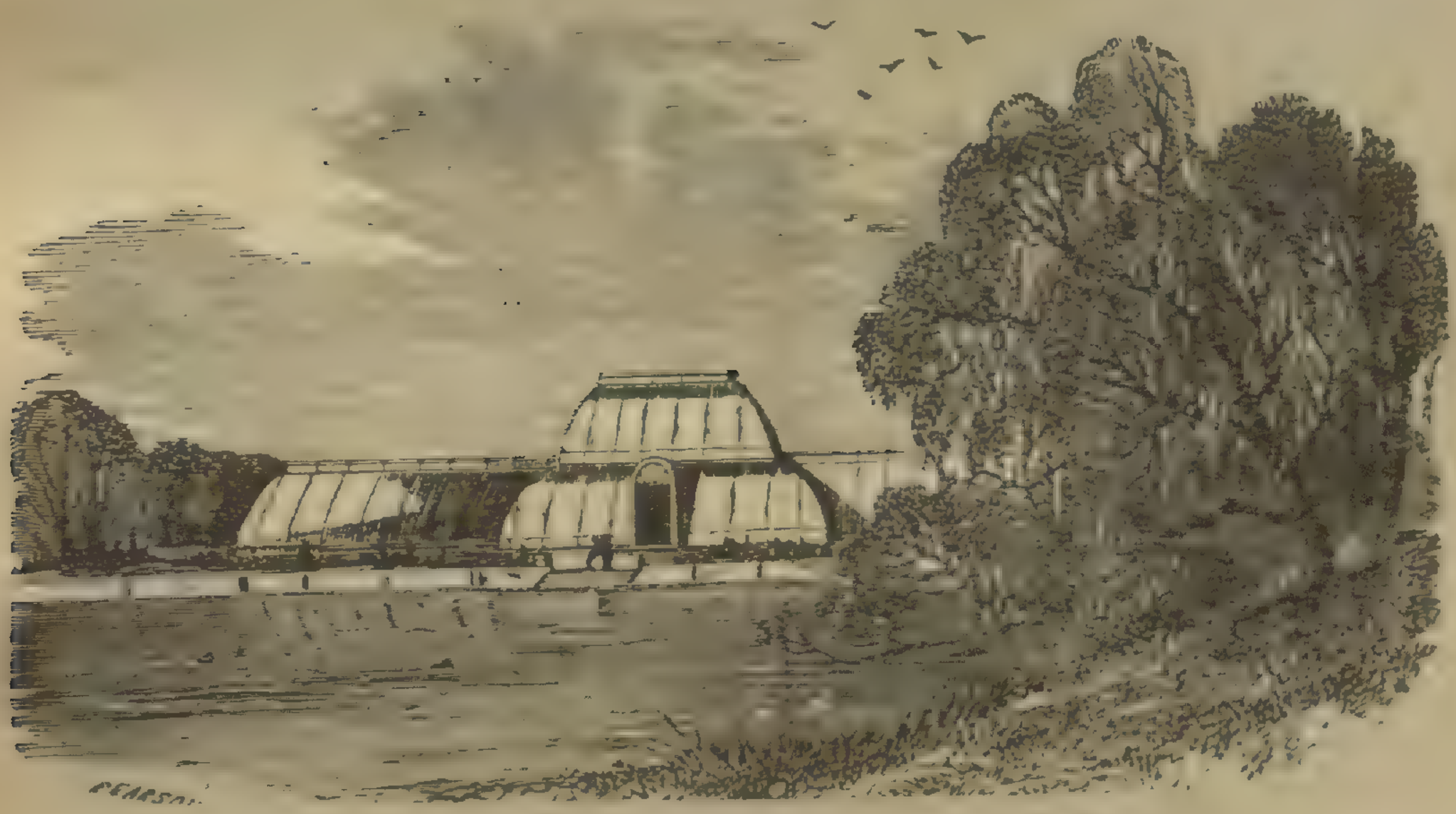

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Tab. 8142.

ODONTOGLOSSUM Leeanum.

Colombia.

Orchidaceae. Tribe Vandeae.

Odontoglossum, *H.B. et K.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 561.

Odontoglossum Leeanum, *Reichb. f. in Gard. Chron.* 1882, vol. xvii. p. 525; 1883, vol. xix. p. 694; 1902, vol. xxxi. p. 50 (var. Crawshayanum); *Will. Orch. Alb.* vol. iii. t. 101; *Journ. Hort.* 1901, vol. xliii. p. 193, cum ic.; *Rolfe in Orch. Rev.* 1893, pp. 172, 174; hybrida naturalis, probabiliter inter *O. gloriosum*, Lind. et Reichb. f., et *O. triumphans*, Reichb. f., producta.

Herba epiphytica. *Pseudobulbi* fasciculati, ovoideo-oblongi, subcompressi, 4–5 cm. longi, 2·5–3·5 cm. lati, basi et apice diphylli. *Folia* coriacea, lineari-oblonga, subacuta, 15–20 cm. longa, 1·5–2·3 cm. lata. *Scapi* axillares, suberecti, 30–45 cm. longi, racemosi vel laxe paniculati, multiflori. *Bracteae* ovato-oblongae, acutae, concavae, 8–10 mm. longae. *Pedicelli* 2–2·5 cm. longi. *Flores* speciosi, lutei, brunneo-maculati. *Sepala* et *petala* subaequalia, patentia, lanceolata, acuminata, circa 4 cm. longa. *Labellum* unguiculatum; unguis erectus, circa 8 mm. longus; limbus patens, deltoideo-triangularis, acuminatus, undulatus, circa 2·5 cm. longus, basi 1·3 cm. latus; discus puberulus, bicallosus, callis lamellatis. *Columna* clavata, arcuata, 1·8 cm. longa; alae oblongae, falcatae, apice acuminatae, circa 4 mm. longae.—*O. odoratum var. Leeanum*, Veitch, Man. Orch. vol. i. p. 56. *O. lanceans var. Leeanum*, Reichb. f. in Sander, Reichenbachia, ser. 1, vol. i. p. 82.

This striking *Odontoglossum* appeared quite unexpectedly as a single plant in Messrs. James Veitch & Sons' Nursery at Chelsea, in 1882, and was described by Reichenbach as a doubtful natural hybrid, the author remarking that it was distinguishable from *O. deltoglossum*, Reichb. f., by its far longer and narrower lip and bright yellow ground colour. No clue was given as to the habitat or as to the species along with which it was imported, and the point is still veiled in obscurity. In 1887 Messrs. Veitch reduced it to a variety of *O. odoratum*, Lindl., though remarking that it was of supposed hybrid origin, while soon afterwards Reichenbach made it a variety of his *O. lanceans*, a name which he proposed to include the large and polymorphic series of natural hybrids believed to have arisen from the intercrossing of *O. crispum* and *O. gloriosum*. Here it remained for a considerable period, quite anomalous in its deep yellow ground colour. In 1902 a second plant appeared, also unexpectedly, in the establishment of

Messrs. T. Rochford & Co., Broxbourne, and is now in the collection of Mr. De Barri Crawshay, Rosefield, Sevenoaks. It chiefly differs from the original in having fewer and rather larger spots on the sepals and petals. The plant is now recognized as a natural hybrid between *O. gloriosum* and *O. triumphans*, which are known to grow together, and whose characters are clearly combined in it. A flower of each parent is added to the plate, for comparison. A large number of natural hybrid Odontoglossums are now known, and they invariably appear unexpectedly among importations of the parent species, several of which grow intermixed in a wild state.

The figure was prepared from an inflorescence kindly sent by Baron Schröder, The Dell, Egham, in April, 1906, the rest of the plant being taken from the "Orchid Album."

Descr.—An epiphytic herb. *Pseudobulbs* fascicled, subcompressed, $1\frac{1}{2}$ 2 in. long, 1–$1\frac{1}{4}$ in. broad, 2-leaved at apex and base. *Leaves* coriaceous, linear-oblong, subacute, 6–8 in. long, about $\frac{3}{4}$ in. broad. *Scapes* axillary, suberect, 1–$1\frac{1}{2}$ ft. high, racemose, or loosely panicled, many-flowered. *Bracts* ovate-oblong, acute, concave, over $\frac{1}{4}$ in. long. *Pedicels* nearly 1 in. long. *Flowers* showy, bright yellow, blotched with brown. *Sepals* and petals spreading, subequal, lanceolate, acuminate, about $1\frac{1}{2}$ in. long. *Lip* clawed, with the erect claw over $\frac{1}{4}$ in. long; limb spreading, deltoid-triangular, acuminate, undulate, about 1 in. long, $\frac{1}{2}$ in. broad at the base; disc puberulous, with a pair of erect parallel compressed crests. *Column* clavate, arcuate, nearly $\frac{3}{4}$ in. long; wings falcate-oblong, acuminate at the apex, $\frac{1}{6}$ in. long.—R. A. Rolfe.

Fig. 1, part of base of lip; 2, column; 3, pollinarium:—*all enlarged*; 4, whole plant:—*much reduced*; 5, flower of *O. gloriosum*; 6, flower of *O. triumphans* (the reputed parents):—*natural size.*

M. S. del. J. N. Fitch. lith

Vincent Brooks, Day & Son Ltd. imp

L. Reeve & Co. London.

Tab. 8143.

MONTANOA mollissima.

Mexico.

Compositae. Tribe Helianthoideae.

Montanoa, *Llav. et Lex.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 365.

Montanoa mollissima, *Brongn. in Rev. Hortic.* 1857, p. 543; *Koch, Wochenschr.* vol. vii. p. 408; affinis *M. grandiflorae*, DC., sed foliis subtus arachnoideo-tomentosis supra non scabridis differt.

Frutex ramosus, circiter 2 m. altus. *Rami* striati, pubescentes, demum fere glabri. *Folia* sessilia, lanceolata vel ovato-lanceolata, 10–18 cm. longa, 4–9 cm. lata, apice mucronulata, basi auriculata, crenata, supra viridia, glabriuscula, subtus dense albo-arachnoideo-tomentosa, venis utrinque sed praecipue subtus distinctis. *Capitula* circiter 4 cm. diametro, pedunculis circiter 6 cm. longis. *Involucri bracteae* oblongae, subacutae. *Receptaculi paleae* e basi lata subulatae, pilosae, 5 mm. longae. *Flores radii* circiter 9, ♀, albi; tubus 1 mm. longus, glaber; lamina oblongo-obovata, vix 2 cm. longa, 1 cm. lata, 7- vel 8-nervia, apice minute 3-dentata, supra glabra, subtus glanduloso-pilosa. *Styli rami* penicillati, glabri, 1·5 mm. longi. *Flores disci* ♀, flavi; tubus 4 mm. longus, extra pilosus, basi 1 mm. constrictus; lobi deltoidei, obtusi. *Antherae* apiculatae, 2·5 mm. longae. *Stylus* supra medium glanduloso-pilosus, ramis planis 1·5 mm. longis, apice penicillatis. *Achaenia* quadrangularia, 1·5 mm. longa, glabra. *Pappus* nullus.

The cultivated species of the genus *Montanoa* are used in English gardens as sub-tropical bedding plants, and are chiefly grown for the beauty of their foliage. *M. bipinnatifida* is used in this manner, and treated in a similar way to such plants as *Ricinus*, *Melianthus*, and the large-leaved Solanums. They do not flower readily in the open, but on the Mediterranean they bloom as freely as perennial Sunflowers.

M. mollissima is grown in the gardens of South Europe, where it flowers freely, and is very ornamental. At Kew it is treated as a greenhouse shrub. It is readily increased from seeds sown in gentle bottom heat in spring, or by cuttings of roots inserted in autumn, and of the stems or shoots in spring. The plant here figured was raised from seeds received in 1902 from the late Sir Thomas Hanbury, La Mortola.

This species was introduced into cultivation by Ghiesbreght, who sent seeds from Mexico to the Paris Botanic Garden in 1843. It has been reduced to *M. grandiflora*,

which has very rough, scabrid leaves, with distinct brownish hairs on the under surface, whilst the leaves of our plant are quite velvety to the touch, and the hairs beneath are of a white, cobwebby nature.

Descr.—A branching shrub, about 6 ft. high. *Branches* striate, pubescent, at length almost glabrous. *Leaves* sessile, lanceolate, or ovate-lanceolate, 4–7 in. long, $1\frac{1}{2}$–4 in. broad, apex mucronulate, auriculate at the base, crenate, green and almost glabrous above, densely covered with a white tomentum below; veins distinct on both sides, especially beneath. *Capitula* about $1\frac{1}{2}$ in. in diameter; peduncles about $2\frac{1}{2}$ in. long. *Involucral bracts* oblong, subacute. *Palea* of the receptacle subulate from a broad base, pilose, about $\frac{1}{4}$ in. long. *Ray-flowers* about 9, ♀, white; tube $\frac{1}{2}$ in. long, glabrous; lamina oblong-obovate, scarcely $\frac{3}{4}$ in. long, $\frac{1}{2}$ in. broad, 7- or 8-nerved, apex minutely tridentate, glabrous above, glandular-pilose below. *Style-branches* penicillate, glabrous. *Disc-flowers* ☿, yellow; tube $\frac{1}{6}$ in. long, pilose outside, constricted at the base; lobes deltoid, obtuse. *Anthers* apiculate. *Style* glandular-pilose above the middle; branches flattened, penicillate at the apex. *Achenes* quadrangular, glabrous. *Pappus* none. —J. Hutchinson.

Fig. 1, involucral bract; 2, ray-floret; 3, palea of receptacle; 4, disk-floret; 5, anthers; 6, style arms:—*all enlarged.*

M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lt.d imp.

L. Reeve & Co. London.

Tab. 8144.

KENNEDYA retrorsa.

Eastern Australia.

Leguminosae. Tribe Phaseoleae.

Kennedya, *Vent.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 531.

Kennedya retrorsa, *Hemsl. sp. nov.* legumine densissime retrorso-piloso insignita.

Frutex volubilis, praesertim in ramis rufescenti-tomentosus. *Folia* stipulata, trifoliolata, distincte petiolata, 8–15 cm. longa. *Stipulae* ovatae, circiter 5 mm. longae. *Foliola* stipellata, petiolulata (terminale longe) crassiuscula, inaequalia, elliptica, oblonga, obovata, vel fere orbicularia, 3–12 cm. longa, apiculata, supra strigillosa, subnitida, subtus ferrugineo-pubescentia. *Stipellae* minutae. *Flores* roseo-purpurei, circiter 1·5 cm. longi, fasciculato-racemosi; racemi cum pedunculo 5–15 cm. longi vel in speciminibus nonnullis spontaneis usque ad 25 cm. longi, pedicellis 3–5 mm. longis. *Bracteae* ferrugineo-sericeae, ovato-caudatae, alabastra excedentes, ante anthesin deciduae. *Calyx* dense sericeo-hirsutus, bilabiatus, labio superiore bidentato; labium inferius aequaliter trilobatum, lobis triangulari-acuminatis. *Vexillum* oblato-orbiculatum, circiter 1·5 cm. diametro, breviter unguiculatum, prope basin macula orbiculari unica alba ornatum. *Alae* et *carinae* petala similia, obovata vel spathulata, apice rotundata, circiter 1·2–1·5 cm. longa, longiuscule unguiculata, auriculata, auriculis prominentibus acutis. *Stamina* praeter superius liberum connata; antherae uniformes. *Ovarium* sessile, praesertim secus suturam ventralem pilosum, 4-ovulatum. *Legumen* planum, rectum, 4–5 cm. longum, 7–8 mm. latum, aculeato-apiculatum, undique densissime retrorso-pilosum, saepius 4-spermum. *Semina* fere nigra, reniformia, 6–7 mm. longa. strophiolo albo claviformi, circiter 4 mm. longo ornata.

Although unequal as an ornamental plant to some of the other species of *Kennedya* in cultivation, *K. retrorsa* is very pretty, and, as it is a very free grower, it is deserving of attention, especially as the wild specimens are much finer than the cultivated ones that we have seen so far. It was raised at Kew in 1905 from seed received from the Sydney Botanic Garden, under the name of *K. procurrens*, Benth.; but it is quite distinct from that species, the type of which is in the Kew Herbarium. The wild specimens are from Mount Dangar Gungal, Merriwa, Brisbane Co., New South Wales, in about 32° S. lat., and 150° E. long. The fact that the flowers were produced in March may account for their being in smaller clusters than the wild ones.

Descr.—A twining shrub, the young growths clothed with reddish hairs. *Leaves* trifoliolate, distinctly stalked, 3–6 in. long. *Stipules* ovate, about $\frac{1}{5}$ in. long. *Leaflets*

stipellate, shortly stalked, rather thick, unequal, oval, oblong, obovate, or nearly orbicular, 1–2½ in. long, apiculate, strigillose above, shining, rusty-hairy beneath. *Flowers* rose-purple, with a white eye on the standard, about ⅗ in. in the greatest diameter, clustered in racemes; racemes, including stalk, 2–6 in. long, or as much as 10 in. in some wild specimens; pedicels ⅙–¼ in. long. *Bracts* rusty-hairy, ovate-caudate, longer than the flower-buds, falling off before the flowers expand. *Calyx* densely silky-hairy, 2-lipped; upper lip bidentate; lower lip equally 3-lobed, lobes triangular, acuminate. *Standard* nearly orbicular, shortly clawed. *Wing-petals* and *keel-petals* similar, obovate, rounded, clawed, auriculate above the base. *Stamens* 10, upper one free. *Ovary* sessile; style included. *Pod* flat, straight, about 2 in. long, rigidly apiculate, densely clothed with reversed hairs, usually 4-seeded. *Seeds* almost black, reniform, about ¼ in. long, furnished with a white, clavate strophiole, about ⅙ in. long.—W. Botting Hemsley.

Fig. 1, calyx and genitalia; 2, standard; 3, a wing-petal; 4, a keel-petal; 6, a pod; 7 and 8, seeds:—*all enlarged except* 6 *and* 7, *which are natural size.*

M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lith. Imp.

L. Reeve & Co. London.

Tab. 8145.

STEWARTIA Malachodendron.

Eastern North America.

Terustroemiaceae.

Stewartia, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 185 (*Stuartia*).

Stewartia Malachodendron, *Linn. Sp. Pl.* ed. l. p. 698 (sphalmate *Malacodendron*; species a *S. pentagyna*, L'Herit., stylis connatis, a *S. Pseudocamellia*, Maxim., floribus subsessilibus differt, ab ambabus petalis stellatim divergentibus recedit.

Frutex ramosus, 2–4 m. altus vel raro arbor parva, ramulis floriferis gracilibus appresse pubescentibus. *Folia* decidua, alterna, brevissime petiolata, lanceolata vel oblanceolata, 5–10 cm. longa, acuminata, praecipue supra medium calloso-denticulata, subtus puberula. *Flores* axillares, solitarii, 9–10 cm. diametro, brevissime pedunculati; pedunculis bibracteolatis, bracteolis sericeis 3–4 mm. longis. *Sepala* 5, basi connata, ovato-oblonga, circiter 1 cm. longa, subacuta. *Petala* 5, alba, obovata, 4–5 cm. longa, apice rotundata, minute crenulata, extus sericea, ima basi connata. *Stamina* numerosa; filamenta infra medium dilatata, superne filiformia, basi petalis adnata, purpurea, antheris caeruleis. *Ovarium* sericeo-hirsutum, 5-loculare, loculis 2-ovulatis; styli connati. *Capsula* lignosa, ovoidea, vel subglobosa, circiter 1·5 cm. diametro, loculicide dehiscens. *Semina* parva, lenticularia, margine nuda.—*Stewartia virginica*, Cav. Diss. t. 159, f. 2; Sprague et A. Gray Gen. Fl. An. Bor. Illustr. vol. ii. t. 138 (*Stuartia*); *Gard. Chron.* 1877, vol. vii. pp. 433–435, f. 86. *Stuartia Malachodendron*, L'Herit. Stirpes Novae, 1784, p. 153, t. 73; Britton & Brown, Ill. Fl. N. U. States and Canada, 1897, vol. ii. p. 426. *Stewartia marilandica*, Andr. Bot. Rep. t. 397. *Stewartia*, Catesby, Nat. Hist. Carol. ed. 1, vol. ii. (1743?) App. p. 13, t. 13.

There are three species of *Stewartia*, namely, *S. Pseudocamellia*, Maxim. (B. M. t. 7045), from Japan; *S. pentagyna*, L'Her. (B. M. 3918), North America, and the one here figured, which is better known under the name of *S. virginica*, Cav. Mark Catesby, in his monumental work cited above, says of this shrub: "For this elegant plant I am obliged to my good friend, Mr. Clayton, who sent it to me from Virginia, and three months after its arrival it blossomed in my garden at Fulham in May, 1742." From a letter by Dr. John Mitchell to Catesby, published in the place cited above in Catesby's "History" the following passage is extracted: "The plant which you showed me by the name of *Stewartia* I take to be a new genus of plants, the same that I called *Malachodendron*." The latter had previously been published by Mitchell (*Act. Phys. Acad. Nat. Cur.* vol. viii. *App.* 1748, p. 216), and repeated

in his "Dissertatio Brevis, &c., Nov. Pl. Gen.," 1769, p. 38. Subsequent authors have frequently misprinted it *Malacodendron*, and Cavanilles (*Diss.* v. 1788, pp. 302-303, t. 158, f. 2, t. 159, f. 2) separated the two American species generically, adopting *Malachodendron* for *S. pentagyna*, and *Stewartia* for *S. virginica*. On account of this confusion the late Dr. A. Gray retained the name *virginica* for the species here figured; but that did not remove the confusion. The mode of spelling the generic name was changed by L'Heritier (l.c.) who deliberately adopted the form *Stewartia*. "Stewartiam consecrabat Linnaeus memoriae illustriss. Joannis Stuart, Comitis a Bute, Paris Angli . . . ergo *Stuartia*, nec Stewartia dicenda." Most English and American writers have followed L'Heritier, and Britton and Brown (l.c.) have retained the altered form. Even Willdenow (*Species Plantarum*, 1800, vol. iii. p. 840) adopted *Stuartia Malachodendron*. As Linnaeus incorrectly cites Mitchell there is no necessity for continuing the typographical error in the specific name, especially as the form *Malachodendron*—mallow-tree, is appropriate, whilst *Malacodendron*—soft-tree, is here meaningless. With regard to the generic name it is different; Linnaeus, although he cites Catesby's page and plate, does not cite his name.

This very ornamental shrub has never got into general cultivation in British gardens, perhaps partly on account of its not flourishing in ordinary garden soil, and partly because it does not usually flower freely until it has attained a considerable size. Catesby does not say anything about the size of his plant, which flowered three months after it reached England; but it may be assumed that it was quite small. Philip Miller also mentions its having flowered before 1756, in Mr. Christopher Gray's nursery garden at Fulham; and there are some recent records of its having flowered profusely, notably at Syon House. The drawing for the accompanying plate was made from specimens communicated by Sir Joseph Hooker, in whose garden at Sunningdale it flowered freely last year.

Descr.—A branching shrub, or small tree, 6–14 ft. high, with slender, pubescent flowering branches. *Leaves* deciduous, alternate, very shortly stalked, lanceolate or

oblanceolate, 2–4 in. long, acuminate, minutely toothed chiefly above the middle, puberulous underneath. *Flowers* axillary, solitary, almost sessile, $3\frac{1}{2}$–4 in. across. *Sepals* 5, connate at the base, ovate-oblong, about $\frac{1}{3}$ of an in. long. *Petals* 5, white, obovate, rounded, minutely toothed. *Stamens* numerous, purple; anthers blue. *Seed-vessel* ovoid, woody, about $\frac{1}{2}$ in. in diameter, opening down the backs of the five cells. *Seeds* one or two in each cell, small, lenticular.—W. B. Hemsley.

Cultiv.—Coming from the coast regions of the South-eastern United States this shrub should be given a sheltered position, for it is more likely to be injured by persistent exposure to north and east winds than by temporary spells of severe cold. At Kew it has passed through the winters of the last ten years without suffering. A moisture-loving plant, it should be planted only where it is not likely to suffer from drought. It loves a peaty soil, and if peat is not naturally present in the soil a proportion of one-third should be added.—W. J. Bean.

Figs. 1 and 2, anthers; 3, pistil:—*all enlarged.*

2

1

4

5

6

3

M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lt.d imp

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Tab. 8146.

PHYLLODOCE Breweri.

California.

Ericaceae. Tribe Phyllodoceae.

Phyllodoce, *Salisb. Parad. Lond.* t. 36; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 595; *Maxim. in Mem. Ac. Sc. Petersb.* sér. 7, vol. xvi. no. 9, p. 5; *Drude in Engl. & Prantl, Nat. Pflanzenf.* vol. iv. 1, p. 40.

Phyllodoce Breweri, *Maxim.* l.c.; *P. empetriformi,* Don., affinis, sed floribus majoribus, corolla late campanulata ultra medium 5-fida, staminibus exsertis distincta.

Fruticulus 20–30 cm. altus, ramis ascendentibus rigidis dense foliatis. *Folia* creberrima, subsessilia, linearia, obtusa, marginibus arcte revolutis, 1–1·5 cm. longa, 1–1·5 mm. lata, supra laevia, glaberrima, subtus ob costam validam et margines revolutas bisulcata, in sulcis glanduloso-pubescentia. *Flores* e gemmis hibernantibus versus apices ramorum singuli orti, racemose dispositi, saepe plurimi, racemum densum brevem rarius elongatum referentes; pedicelli tenues, glandulosi, 0·5–1·5 (plerumque 1) cm. longi. *Sepala* elliptico-ovata, 3–4 mm. longa, glabra, purpurascentia. *Corolla* late campanulata, ultra medium 5-fida, 5–6 mm. longa, rubro-purpurea, lobis late ovatis obtusis. *Stamina* normaliter 10: filamenta 5–7 mm. longa; antherae 1·5 mm. longae. *Ovarium* 5-loculare, glandulosum; stylus 6 mm. longus. *Capsula* globosa, 4 mm. diam.—*Bryanthus Breweri*, A. Gray in Proc. Am. Acad. vol. vii. p. 367; Syn. Fl. N. Am. vol. ii. part I. p. 37.

P. Breweri is a native of the inner Sierras of California, between 34° and 40° N. lat. It was first observed by W. H. Brewer, who was attached to Prof. Whitney's surveying party from 1860–1864. He collected the plant in the ordinary state with relatively loose inflorescences on Wood's Peak, Eldorado Co., and in the form here figured and distinguished by compact racemes, on Mt. Hoffmann, on the north side of the Yosemite Valley. It is a characteristic plant of the alpine zone from 3,000 to over 3,600 m., and in some places forms extensive heather-like patches. It is, as might be expected, quite hardy with us, but a slow grower. At Kew it flowered in May. Its corollas are the largest in the genus, and produce a fine effect. Like its allies it prefers a peaty soil. It may be propagated from seeds or cuttings or layers. The plant figured was raised from seeds presented to Kew in 1896 by Baron von St. Paul, of Fischbach, Silesia. The question whether this plant should be placed in *Phyllodoce* or *Bryanthus* has been much discussed; but Maximowicz, and more recently Drude, the monographer of the *Ericaceae*

in Engler and Prantl's "Natürlichen Pflanzenfamilien," have come to the conclusion that *Bryanthus* should be reserved for the species on which the genus was originally based, namely, *B. Gmelini*, Stell., a plant so far only known from Kamtschatka, the adjacent Komanderskie Islands and Ochotsk. It is a small shrublet, with tetramerous, rather inconspicuous flowers and rotate corollas.

Descr.—A shrublet, 9 in. high, with ascending, rigid, very densely leafy branches. *Leaves* crowded, subsessile, linear, obtuse, with tightly revolute margins, $\frac{1}{2}$–$\frac{2}{3}$ in. long, $\frac{1}{24}$–$\frac{1}{16}$ in. broad, smooth above, bisulcate and glandular-pubescent in the grooves. *Flowers* solitary from hibernating buds, arranged in terminal short or long, and sometimes very dense racemes; pedicels slender, glandular, $\frac{1}{4}$–$\frac{2}{3}$ (usually $\frac{1}{2}$) in. long. *Sepals* elliptic-oblong, $\frac{1}{8}$–$\frac{1}{6}$ in. long, glabrous, purpurascent. *Corolla* bright rose colour or purple, wide-campanulate, 5-fid beyond the middle; lobes broad, ovate, obtuse. *Stamens* normally 10; anthers $\frac{1}{16}$ in. long, exserted from the corolla. *Ovary* 5-celled, glandular; styles up to $\frac{1}{4}$ in. long. *Capsule* globose, $\frac{1}{6}$ in. in diameter.—Otto Stapf.

Cultiv.—The plant here figured and described is cultivated in semi-shade in the rock garden at Kew, where it has proved quite hardy, but has grown slowly. It is now a loose tuft a foot through, the stems 6–9 in. high, and covered with heath-like evergreen leaves. It flowered freely for the first time in 1906, and in May it was quite attractive. There is no marked difference between the several species of *Phyllodoce* and *Bryanthus* as regards cultivation; they have the same heath-like habit and foliage, and they are also alike in their preference for a peaty soil. The present species is, perhaps, the largest flowered, and it is also distinct in the spicate arrangement of the flowers on the stem, the other species having them in terminal clusters. All of them are very suitable for cultivation in the alpine garden or rockery. They ripen seeds in favourable seasons, and they may be increased by means of cuttings or layers.—W. Watson.

Fig. 1, lower leaf; 2, upper leaf; 3, calyx and pistil; 4 and 5, anthers; 6, ovary :—*all enlarged*.

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Tab. 8147.

ALOE NITENS.

South Africa.

Liliaceae. Tribe Aloineae.

Aloe, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 776.

Aloe nitens, *Baker in Journ. Linn. Soc.* vol. xviii. p. 170, *et in Thiselton-Dyer, Fl. Cap.* vol. vi. p. 325, non Schult. f.; *A. africanae*, Mill., affinis, a qua inflorescentia paniculata perianthioque recto viridi recedit.

Caulis simplex, circa 3 m. altus, 7·5 cm. diam. *Folia* prope apicem caulis congesta, lanceolata, glabra, 60 cm. longa, 6 cm. lata; spinae curvatae, brunneae, 3 mm. longae, inter se 8 mm. distantes. *Panicula* racemosa; pedunculi patentes, circa 35 cm. longa; spica multiflora, eam *Kniphofiae alooidis*, Moench, simulans; bracteae circa 10 cm. longae; bracteolae dense imbricatae, lunatae, 5 mm. diam., marginibus membranaceis valde recurvis. *Flores* subsessiles, virides. *Perianthium* rectum, cylindricum, 2 cm. longum; segmenta oblonga, obtusa, 4 mm. lata, exteriora herbacea, 5-nervia, interiora membranacea, 3-nervia. *Stamina* perianthio duplo longiora; filamenta complanata, basi 1 mm. lata, in antherae foveola dorsifixa; antherae oblongae, 4 mm. longae, apiculatae. *Ovarium* ovoideum, 6 mm. longum; stylus staminibus aequilongus.

For years *Aloe nitens* has been one of the most striking of the many species cultivated in the Succulent House at Kew, flowering in midwinter every year when its large inflorescence, formed of six or more branches, each bearing a cluster of rich crimson flowers, is a great attraction. It was sent to Kew in 1877 by Sir Henry Barkly when Governor at the Cape, and it is now a fine specimen 12 ft. high, the upper half clothed with long green leaves.

Descr.—*Stem* unbranched, about 12 ft. high, 3 in. in diameter, pale brown. *Leaves* crowded into an apical crown, lanceolate, glabrous, about 2 ft. long and $2\frac{1}{3}$ in. wide, edged with stout brown upcurved spines $\frac{1}{8}$ in. long, and about $\frac{1}{3}$ in. apart. *Panicle* bearing about 7 spikes racemosely arranged; peduncles patent, about 14 in. long; spikes densely many-flowered, resembling those of *Kniphofia alooides*, Moench; bracts about 4 in. long; bracteoles densely imbricate, lunate, about 3 lin. across, with strongly recurved membranous margins; flowers subsessile. *Perianth* straight, cylindrical, $\frac{3}{4}$ in. long, green; segments oblong, obtuse, $\frac{1}{6}$ in. wide, the outer herbaceous and

5-nerved, the inner membranous and 3-nerved. *Stamens* twice as long as the perianth; filaments flattened, $\frac{1}{24}$ in. wide at the base, inserted into a pit at the back of the anther near its base; anthers oblong, $\frac{1}{5}$ in. long, apiculate. *Ovary* ovoid, $\frac{1}{3}$ in. long; style as long as the stamens.—C. H. Wright.

Cultiv.—Although the genus *Aloe* is not popular in English gardens, a considerable number of the species are decidedly ornamental; their flowers are attractive in form and colour, and they are among the easiest of plants to cultivate. They are generally grown in pots, but where space can be afforded they grow more quickly, and are much happier when planted in a border of gravelly soil. *A. nitens* is one of the less tropical species; it would probably be an ideal plant for the gardens of the Riviera. —W. Watson.

Fig. 1, flower; 2 and 3, stamens; 4, pistil: —*all enlarged*; 5, sketch of the whole plant:—*much reduced.*

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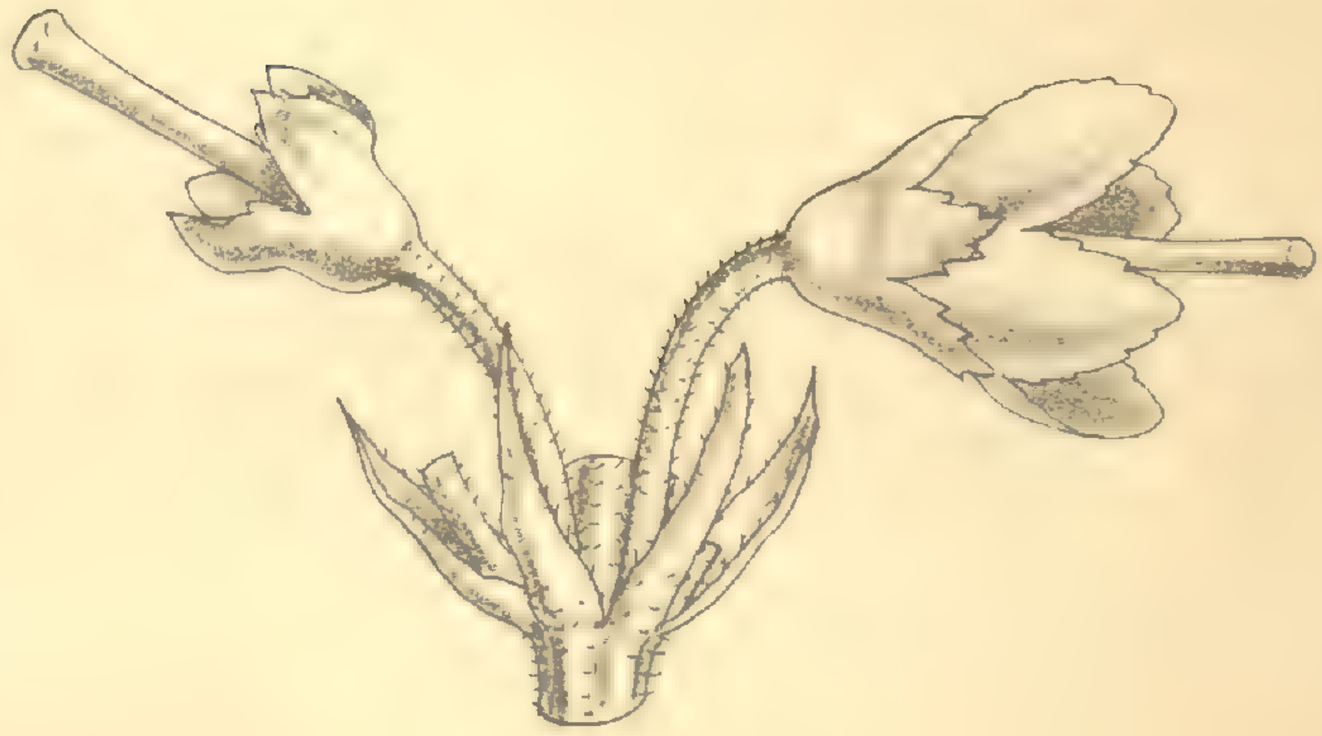

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Tab. 8148.

BRUCKENTHALIA SPICULIFOLIA.

Transylvania, Balkan Peninsula, and Northern Asia Minor.

ERICACEAE. Tribe ERICEAE.

BRUCKENTHALIA, *Reichb. Fl. Germ. Excurs.* 413; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 591; *Drude in Engl. & Prantl, Nat. Pflanzenf.* vol. iv. 1, p. 62.

Bruckenthalia spiculifolia, *Reichb. l.c.* p. 414; *species unica.*

Fruticulus multiramosus, 10–15 cm. altus, ramis ascendentibus gracilibus tenuiter pubescentibus. *Folia* creberrima, quaterna vel sparsa, subsessilia, linearia, margine arcte replicata, obtusiuscula, apice seta pellucida imposita, 3–4 mm. longa, 0·5 mm. lata, coriacea, supra sparse setulis glanduligeris obsita, subtus ob costam crassiusculam et margines replicatas bisulcata. *Flores* in racemos terminales densiusculos congesti, nutantes; pedicelli minute asperuli, 3 mm. longi. *Calyx* campanulatus, coloratus, glaber, 4-lobus, lobis late triangularibus, vix 1·5 mm. altus. *Corolla* rosea, campanulata, 3 mm. longa, 4-loba, lobis late ovatis obtusis. *Stamina* 8, inclusa; filamenta ima basi inter se et cum corolla connata; antherae 1 mm. haud attingentes, apice bilobae, muticae. *Discus* vix ullus. *Stylus* longe exsertus. *Capsula* globosa, calycem persistentem haud superans.—*Erica spiculifolia,* Salisb. in Trans. Linn. Soc. vol. vi. (1802), p. 324; Sibth. Fl. Graeca, tab. 353. *E. Bruckenthalii,* Spreng. Neue Entd. vol. i. p. 271. *Menziesia Bruckenthalii,* Baumg. Enum. Stirp. Transs. vol. i. p. 333.

Bruckenthalia spiculifolia was discovered by Sibthorp on Keshish Dagh, the so-called Bithynian Olympos, near Brussa, in Asia Minor, more than a hundred years ago, and described as *Erica spiculifolia* by Salisbury in 1802. Subsequently it was found in the Transylvanian Alps, and described by Baumgarten in 1816 as *Menziesia Bruckenthalii,* after Samuel and Michael, Barons von Bruckenthal, prominent contemporary Transylvanian noblemen. The plant has quite the appearance of a small *Erica*, but differs from that genus in the campanulate calyx and the almost complete absence of a disc. Its area covers the greater part of the Balkan Peninsula, excepting Greece; extends over the Transylvanian Alps, and reaches its northernmost point in the Biharia Mountains in Hungary. In Asia Minor it has, so far, been found only on Keshish Dagh, and on the mountains between Tireboli and Gumush Khane, in the vilayet of Trebizond. *Bruckenthalia* grows either socially in extensive heath-like patches, or scattered among species of *Vaccinium*, dwarf juniper, and similar

shrublets. It ascends to over 2,000 m., but flourishes best in the upper subalpine zone, and is a great ornament of its native mountains comparable in effect to the *Erica carnea* of the Alps.

Descr.—A much-branched shrublet, about $\frac{1}{2}$ foot high, with slender, pubescent, ascending branches. *Leaves* crowded, more or less in whorls of four, subsessile, linear with tightly recurved margins, obtuse, with a terminal bristle, $\frac{1}{8}$–$\frac{1}{6}$ in. long, $\frac{1}{48}$ in. wide, coriaceous, with scattered gland-tipped bristles above, and two grooves beneath. *Flowers* in dense terminal racemes, nodding; pedicels asperulous, $\frac{1}{8}$ in. long. *Calyx* campanulate, coloured, glabrous, 4-lobed; lobes broadly triangular. *Corolla* rose-coloured, campanulate, $\frac{1}{8}$ in. long, 4-lobed; lobes broadly ovate, obtuse. *Stamens* 8, included; filaments united at the very base, and attached to the base of the corolla; anthers not quite $\frac{1}{24}$ in. long, bilobed. *Disc* indistinct. *Style* long, exserted. *Capsule* globose, small.—Otto Stapf.

Cultiv.—One of the prettiest and daintiest of the smaller *Ericaceae*, *Bruckenthalia spiculifolia* thrives at Kew very well in the open air, planted in a light, peaty soil, where it forms close tufts about 6 in. high, and a foot or more across. Commencing to flower about mid-June, it remains in that state for at least a month, the whole plant being covered with the short, erect racemes. It produces good seeds yearly, and these afford the best means of increase. The species is not often met with in gardens, but as seeds have been offered in exchange for several years past, and have been freely asked for, it will probably become more common. Although quite hardy, the plant is too small to withstand rough shrubbery treatment. The best place for it is, perhaps, a shelf or miniature plateau on the rockery. Failing such a situation a front place in a group of the smaller Ericaceous or other peat-loving plants might be accorded it.—W. J. Bean.

Fig. 1, foliage, 2; two flowers; 3, 4, and 5, anthers; 6, pistil:—*all enlarged.*

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M.S. del. J.N. Fitch lith.

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Tab. 8149.

CALATHEA angustifolia.

Central America.

Scitamineae. Tribe Maranteae.

Calathea, *G. F. W. Meyer*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 653; *K. Schum. in Engl. Pflanzenr., Marantaceae*, p. 69.

Calathea angustifolia, *Koern. in Gartenfl.* 1858, p. 87, *Mittheil. Russ. Gartenb.* 1860, p. 94, *et in Bull. Soc. Imp. Nat. Mosc.* vol. xxxv. pars i. p. 136; *Peters in Mart. Fl. Bras.* vol. iii. pars iii. p. 116; *K. Schum. in Engl. Pflanzenr., Marantaceae*, p. 110; *C. varianti*, Koern., proxima, foliis subtus pilosis differt.

Herba acaulis. *Folia* radicalia, anguste oblonga, acuminata, basi obtusa, utrinque pilosa, supra viridia, subtus purpurea, circa 60 cm. longa, 12 cm. lata; petiolus circa 60 cm. longus, viridis, rubro-maculatus, parte superiore 2–3 cm. longa glabra callosa excepta pilis patentibus dense vestitus; vagina membranacea, patentim pilosa, rubro-maculata. *Scapus* 15 cm. altus, lutescens, rubro-maculatus; bracteae lanceolatae, lutescentes vel pallide virides, rubro-pilosae; bracteolae lanceolatae, glabrae, hyalinae; spica 15 cm. longa; flores bini dispositi, 2·5 cm. diam. *Sepala* lineari-lanceolata, acuminata, hirsuta. *Corolla* dilute lutea; tubus hirsutus, cylindricus, 2·2 cm. longus; lobi lanceolati, 1·4 cm. longi. *Staminodium* exterius obovato-oblongum, 1·5 cm. longum; interius exteriori simile sed paullo brevius; staminodium cucullatum, 7 mm. longum. *Ovarium* apice luteo-sericeum.—*Maranta discolor* et *Heliconia discolor*, Hort. ex Koern. in Gartenfl. 1858, p. 87.

Many of the plants of this order are cultivated on account of the beauty of their leaves, and receive names in gardens before they produce flowers, upon the structure of which the various genera are founded; hence a complicated synonymy has arisen. The present species is an instance of this, for it was cultivated before 1858 at St. Petersburg and Berlin under the names of *Maranta discolor* and *Heliconia discolor* respectively, but (while its flowers were still unknown) was transferred by Koernicke to *Calathea* on account of its great resemblance in habit and foliage to his *C. varians*, an assumption which subsequent flowering has justified. The plant here depicted has been cultivated at Kew for many years.

Descr.—A stemless herb, with leaves reaching a height of about 4 ft. *Leaves* narrowly oblong, acuminate, obtuse at the base, pilose on both surfaces, green above, purple beneath, 2 ft. long, nearly 5 in. wide; petiole about 2 ft. long, green, spotted with red, densely clothed with patent

hairs, except for about an inch below the blade, where it is glabrous and swollen; sheath membranous, patently hairy, red-spotted. *Scape* 6–10 in. high, yellowish, spotted with red; bracts lanceolate, yellowish or pale green, clothed with red hairs; bracteoles lanceolate, glabrous, hyaline; spike about 6 in. long; flowers in pairs beneath each bract, about 1 in. in diameter. *Sepals* linear-lanceolate, acuminate, hirsute. *Corolla* pale yellow; tube hirsute, cylindrical, about 1 in. long; lobes lanceolate, about half as long as the tube. *Staminodes* pale yellow; the outer obovate-oblong, $\frac{2}{3}$ in. long; the inner like the outer, but slightly shorter; the hooded one about $\frac{1}{3}$ in. long. *Ovary* yellow-silky at the apex.—C. H. Wright.

Cultiv.—Both Calatheas and Marantas give a better account of themselves when they are planted in a border of light rich soil than when kept confined in flower-pots. This is abundantly proved by the behaviour of a selection of the two genera in the Nepenthes House at Kew, where, along with various other plants of similar habit and requirements, they are used to furnish a rockery border under the Nepenthes, which are grown in baskets suspended from the roof. The growth of the Calatheas in this house is so vigorous that some of them become quite changed in character. *C. angustifolia* is usually a small and unattractive plant, but here it has formed a stately mass of elegant leaves 4 ft. high, dark green above, purple below, the petioles prettily mottled, whilst the flower scapes are 10 in. high, the upper half crowded with cream-yellow flowers, and looking not unlike a good yellow hyacinth. All the species enjoy a light rich soil, plenty of moisture, shade, and a tropical temperature.—W. Watson.

Fig. 1, sepal; 2, flower; 3, stamen and staminodes; 4, cucullate staminode: —*all enlarged*; 5, sketch of the whole plant, *much reduced*.

M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lith. Imp.

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Tab. 8150.

STREPTOCARPUS Holstii.

East Tropical Africa.

Gesneraceae. Tribe Cyrtandreae.

Streptocarpus, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1023.

Streptocarpus Holstii, *Engler, Jahrb.* vol. xviii. (1893), p. 77, tt. 4 et 5; e grege *S. Kirkii,* Hook. f. (B. M. t. 6782) et *S. caulescentis,* Vatke (B. M. t. 6814), sed habitu graciliore, foliorum petiolis longioribus et florum colore caeruleo differt.

Caules graciles, metrales vel ultra, debiles, quadrangulares, cito glabrescentes, nitidi, ad nodos incrassatos primum pilosi. *Internodia* folia subaequantia. *Folia* tenuia, subcarnosa, longe petiolata, ovata, oblonga, vel fere orbicularia, absque petiolo 1·5–4 cm. longa, obtusa, integra, praesertim subtus secus costam venasque pilis crassiusculis parce vestita; venae primariae laterales utrinque 7–9, subtus elevatae; petiolus laminam fere aequans. *Cymae* 2–6-florae, pilis glandulosis parcissime instructae, in foliorum superiorum axillis graciliter pedunculatae, 10–15 cm. longae, erectae, pedicellis capillaribus quam flores longioribus. *Flores* "saturate caerulei," circiter 2·5–3 cm. longi et 1·5 cm. diametro. *Calyx* crassus, pilosulus, subaequaliter 5-lobus, lobis oblongis circiter 2 mm. longis obtusiusculis apice incrassatis. *Corollae* puberulae labia valde inaequalia, superiore bifido quam inferiore 4-plo breviore. *Antherae* cohaerentes. *Ovarium* glabrum, stylo incluso. *Capsula* glabra, gracilis, 5–6 cm. longa.

This very elegant plant was raised at Kew from seed received from the Berlin Botanic Garden in 1905, and flowered freely in December, 1906. It is a much more ornamental plant than either of the two similar species with which it is compared above, and if it retain the winter-flowering habit it deserves a future in cultivation.

Descr.—A slender, elegant branching herb, about 18 in. high, and as much through. *Stems* weak, 4-angled, glabrescent, shining, thickened at the pilose nodes. *Internodes* about as long as the leaves. *Leaves* thin, somewhat fleshy, long-stalked, ovate, oblong, or nearly orbicular, including stalk $1\frac{1}{2}$–3 in. long, obtuse, entire, slightly hairy, especially on the underside along the mid-rib and primary veins. *Cymes* 2–6-flowered, borne on very slender stalks arising in the axils of the upper leaves, 4–6 in. long, sparingly furnished with glandular hairs; pedicels extremely slender. *Flowers* mauve-purple, with a white throat 1–$1\frac{1}{3}$ in. long, $\frac{2}{3}$ in. across. *Calyx* very small, nearly equally 5-lobed; lobes oblong, obtuse,

thickened at the tip. *Corolla* glandular hairy, very unequally 2-lipped; upper lip very short. *Anthers* 2, connivent. *Ovary* glabrous; style included. *Capsule* slender, twisted, about 2 in. long.—W. Botting Hemsley.

Cultiv.—This is the third and, horticulturally, the best of the caulescent species of *Streptocarpus* introduced into cultivation. They are less decorative than the stemless species, now so popular in gardens, and unless they can be improved by crossing and selecting they are not likely to become favourites with gardeners. So far, all attempts to cross them with species of the stemless section have proved unsuccessful. *S. Holstii* has grown quickly from seeds, forming in less than a year a bushy plant 18 in. high and through. It has been happiest when kept in a moist tropical house, and has been at its best in December. It has ripened seeds, and is probably an annual, or monocarpic, as indeed are all the species in cultivation except *S. Rexii* and its allies, and even they do better when renewed from seeds than as old plants.—W. Watson.

Fig. 1, calyx and pistil; 2, corolla laid open, showing the stamens and staminodes; 3 and 4, stamens:—*all enlarged.*

M.S. del. J.N. Fitch lith.

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Tab. 8151.

DELPHINIUM MACROCENTRON.

Mountains of East Tropical Africa.

Ranunculaceae. Tribe Helleboreae.

Delphinium, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 9.

Delphinium macrocentron, *D. Oliv. in Journ. Linn. Soc.* vol. xxi. p. 397; *Hook. Ic. Pl.* t. 1501; haec species calcaris erecti longitudine insignis.

Herba perennis, pluricaulis, in olla crescens circiter 1·5 m. alta, fere omnino pubescens, caulibus pauciramosis. *Folia* 3–7-palmatipartita, atro-viridia, albo-maculata, circumscriptione fere orbicularia, usque ad 15–18 cm. diametro, sursum gradatim minora; segmenta primaria valde variabilia, nunc 2 cm. lata nunc fere linearia, 3–multilobata, lobis ultimis acutis; petioli usque ad 18 cm. longi, foliorum caulinorum sursum gradatim minora. *Flores* pubescentes, viridi-coerulei vel interdum flavo-coerulei calcare albido 4–5 cm. longo; pedunculi quam flores nunc breviores nunc paullo longiores, prope apicem abrupte recurvi, bibracteolati, bracteolis angustissimis circiter 5 cm. longis. *Sepala* petaloidea lata, superioris calcaratis limbus cordatus reflexus, omnia alia declinata; calcar calycinum rectum, sursum directum, latum, per totam longitudinem cylindricum, obtusissimum. *Petala* 2 superiora in calcar calcare calycino inclusum producta, lamina oblonga sursum leviter dilatata apice truncato-emarginata; 2 inferiora unguiculata, spathulata apice oblique rotundata, breviter bifida. *Stamina* quam petala breviora. *Carpella* 3, pubescentia, **stamina aequantia, matura non visa.**

This Larkspur inhabits the mountains of Eastern tropical Africa, chiefly in the Uganda Protectorate, at elevations of 6,000 to 8,000 ft., and the Hon. Walter Rothschild imported it from Mount Elgon. The plant actually figured was from Mr. James O'Brien's garden at Harrow-on-the-Hill, and Miss O'Brien made the drawing illustrating the habit. Mr. J. Thomson first discovered it in Lykipia, in the Masai Country, in 1884, and there are also specimens in the Kew Herbarium, collected by Bishop Hannington, Mr. A. Whyte, Sir Evan James, and Mr. C. F. Elliott. The plant figured was cultivated in a pot; Mr. O'Brien is of opinion that it may prove to be hardy.

Descr.—A perennial herb, hairy in nearly all parts. *Stems* as grown in a pot about 5 ft. high, slightly branched. *Leaves* palmately divided into 3–7 primary segments varying from $\frac{1}{6}$ to nearly 1 in. across, 3–many-lobed; lobes acute; petioles of the lower leaves 6–8 in.

long, gradually shorter upwards, uppermost sessile. *Flowers* hairy, blue and green, or yellow and green in some of the wild specimens, with a whitish apex, about 2 in. long; peduncles about the same length, sometimes shorter, sometimes longer, abruptly recurved near the apex. *Sepals* 5, petaloid, broad; spur broad, straight, erect, of nearly equal thickness throughout, rounded at the end. *Petals* 4, narrower. *Carpels* three, hairy, ripe ones not seen.—W. Botting Hemsley.

Fig. 1, one of the lower petals; 2, a stamen; 3, pistil; 4, whole plant:—*all enlarged, except* 4.

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Tab. 8152.

ACONITUM NAPELLUS, var. EMINENS.

Rhenish Prussia.

Ranunculaceae. Tribe Helleboreae.

Aconitum, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 9.

Aconitum Napellus, *Linn.*, var. **eminens**, *Wirtgen, Fl. d. Preuss. Rheinprovinz*, p. 21; a typo Linneano altitudine, panicula amplissima, flore magis hiante, galea altiore, nectariis saepe subexsertis, florum et folliculorum magnitudine nec non statione distinctum.

Herba saepe 2 m., interdum ad 2·75 m. alta, praeter inflorescentiam glaberrima. *Folia* laete vel saturate viridia, carnosula, lucidula, inferiora longe petiolata, ambitu reniformi-orbiculata, maxima ad 30 cm. lata, more foliorum typi partita nisi segmentis plerumque latioribus; petioli ad 1·5 cm. longi. *Panicula* maxima, 1–1·25 m. longa, tandem fere e basi ramis florentibus longis aucta, pyramidalis, superne adpresse pubescens; bracteae inferiores more foliorum summorum divisae, summae lanceolatae, simplices, pedicellis multo breviores; pedicelli inferiores ad 8 cm. vel tandem 10 cm. longi; bracteolae oblongae, obtusae, pubescentes, flori arcte approximatae, ad 5 mm. longae, in pedicellis inferioribus medio altera saepe trifida addita. *Flores* intense purpureo-coerulei, rarius purpurascentes vel albo-variegati. *Galea* 20–25 mm. alta, parce pubescens vel praeter margines glabra, ungue latiusculo erecto, cuculla depressa versus rostrum paulo descendente vel subhorizontali. *Sepala lateralia* oblique orbicularia, latissime unguiculata, 15–18 mm. longa, margine superiore a galea remoto, ideoque flore hiante, in facie et ad margines sparse longe pilosa; sepala inferiora oblonga, descendentia, 12–15 mm. longa. *Nectaria* ungue circiter 20 mm. alto sub galea prorsus curvato suffulta, saepe e galea magis minusve exserta, oblonga, apice in dorso gibbosa, 5–7 mm. longa, hinc inde sparse pilosa, labio oblongo breviter bilobo incurvo, 4–8 mm. longo apice intense coeruleo. *Filamenta* paulo ultra medium alata, superne pilosa. *Carpella* 3, rarissime 2 vel 4, oblonga, glabra, sub anthesi erecta, postea divergentes. *Folliculi* maturi contigui, erecti, post dehiscentiam imo apice tantum recurvo, magnitudine valde varii, ad 30 mm. longi, 6–7 mm. lati. *Semina* 3-angulari-obpyramidata, angulis acutis vel subalatis, in facie antica transverse rugosa, in lateribus sublaevia, 4 mm. longa.—*A. eminens*, Koch ex Reichb. Illustr. Acon. gen. t. 16 (lxix.); Wirtgen, Veget. Eifel, p. 201; vix ex Reichb. Übers. d. Gatt. Acon. p. 35 (ubi nomen tantum).

This is by far the most handsome of the numerous varieties or races of *Aconitum Napellus*. It appears to be confined to the limestone zone of the Eifel Mountains. I collected the tubers from which the specimen here figured was raised on the banks of the River Kyll, some miles above Gerolstein, in 1904. There the plant grew most luxuriantly in rich, deep soil, close to the water together with willows, the tallest specimens attaining 2 m. or slightly more. In another locality, on the slopes of the Auburg, to the west of Gerolstein, I found it in almost impenetrable thickets of hazel, *Cornus sanguinea*, *Vibur-*

num Lantana, and other shrubs, sending up its beautiful blue panicles here and there where the thicket was lower and less compact. The tubers were about 10 cm. below the surface among the network of the roots of the shrubs, and very difficult to get at. The tallest plants raised in my garden attained 2·4 m. in 1905, 2·5 m. in 1906, and 2·75 m. in 1907. The top panicle flowers first, and is followed by numerous lateral panicles developing basewards, until in some cases the whole plant represents finally one huge compound panicle. At Gerolstein the flowering was, in 1904, at its best in August. At Kew the plant flowers in August, whilst it starts sprouting at the beginning of March. It is noteworthy that specimens of typical *A. Napellus*, gathered by me at Engstlenalp, Switzerland, and planted side by side with the Eifel plants, sprout at the end of March, that is 3 to 4 weeks later, and yet commence to flower a fortnight before var. *eminens* has begun.

Descr.—A herb, often 7 and even over 9 ft. high, perfectly glabrous, with the exception of the inflorescences. *Leaves* bright or dark green, somewhat fleshy and glossy, the lower long-petioled, reniform-orbiculate in outline, the largest 12 in. across, divided like those of the ordinary monkshood of gardens; petioles up to 6 in. long. *Panicle* very large and compound, 3–5 ft. long, pyramidal, finely adpressedly pubescent in the upper parts; lower bracts like reduced leaves, upper lanceolate, entire, much shorter than the pedicels; bracteoles oblong, obtuse, pubescent, close to the flower. *Flowers* intensely purplish-blue, or sometimes purple or variegated. *Helmet* about an inch long, with a broad claw and a depressed hood; lateral sepals obliquely orbicular, $\frac{1}{2}$–$\frac{3}{4}$ in. long, their upper margins not contiguous with the helmet. *Nectaries* with a slender claw about $\frac{3}{4}$ in. long, and a much inclined and often exserted hood produced into a 2-lobed lip $\frac{1}{6}$–$\frac{1}{3}$ in. long. *Carpels* 3, rarely 2 or 4, oblong, erect, glabrous, divergent after flowering, but ultimately again erect and contiguous. *Follicles* 1–1$\frac{1}{4}$ in. long, about $\frac{1}{4}$ in. wide, the tips recurved after dehiscing. *Seeds* 3-angular, obpyramidal, angles acute, or slightly winged, anticous face transversely wrinkled, $\frac{1}{6}$ in. long.—Otto Stapf.

Fig. 1, part of pedicel; 2, section of flower; 3, nectaries; 4, whole plant:—1–3, *enlarged*, 4, *reduced*.

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Tab. 8153.

ANGRAECUM INFUNDIBULARE.

Tropical Africa.

ORCHIDACEAE. Tribe VANDEAE.

ANGRAECUM, *Thouars*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 583.

Angraecum infundibulare, *Lindl. in Journ. Linn. Soc.* vol. vi. p. 136; *Gard. Chron.* 1904, vol. xxxvi. pp. 82, 130, cum suppl. tab.; *Orch. Rev.* 1905, p. 331; species distinctissima, habitu *A. Eichleriano*, Kränzl., simile, sed labello amplissimo fauce infundibulari et calcare longissimo differt.

Herba epiphytica, scandens. *Caules* validi, 30–60 cm. longi, radicantes. *Folia* disticha, oblonga, inaequaliter biloba, coriacea, 10–12 cm. longa; circa 3 cm. lata; vaginae amplexicaules, striatae, 3–4 cm. longae. *Pedunculi* axillares, 6–7 cm. longi, uniflori. *Bracteae* ovato-oblongae, acutae, circa 8 mm. longae. *Flores* magni, speciosi, pallide flavi; labellum albidum, fauce viride. *Sepala* et *petala* linearia, acuminata, 6–7 cm. longa; petala et sepalum posticum reflexa; sepala lateralia divergentia. *Labellum* magnum, infundibulare; limbus late elliptico-ovatus, apiculatus, 6–7 cm. longus, circa 5 cm. latus; calcar fauce infundibulari 5–6 cm. longo dein valde reflexum, cylindricum, 9–11 cm. longum. *Columna* latissima, circa 5 mm. longa, alis rotundatis; pollinia 2, stipiti plano brevi affixa.—*Mystacidium infundibulare*, Rolfe in Dyer Fl. Trop. Africa, vol. vii. p. 170.

Angraecum infundibulare, Lindl., is a very remarkable species, which was originally discovered in Princes Island, in the Bight of Biafra, West Tropical Africa, by Barter, about the year 1858; the collector describing it as a highly ornamental plant, an exception to African Orchidaceae, and as having large white and fragrant flowers. Nothing further was known of it until 1904, but in July of that year a plant from the collection of the Right Hon. Lord Rothschild, Tring Park, received a First-class Certificate from the Royal Horticultural Society, and this is said to have been collected by Major H. B. Rattray, on the Victoria Nyanza, Uganda, in 1902, a locality over a thousand miles east of the original one. It was also found in Uganda by Mr. M. T. Dawe, Director of the Scientific and Forestry Department, Uganda, who sent living plants to Kew in 1903, which flowered in November, 1906, when the accompanying drawing was made. The Uganda plant has rather broader leaves than that from Prince's Island, but otherwise the two are substantially similar. There is at Kew a dried specimen

collected by Barter at the Brass River, which is identical in habit, but the leaves are larger, and the flowers have fallen, though apparently it represents the same species. Lindley remarked that it belonged to the same set as *Angraecum gladiifolium*, Thouars, and as the pollen was unknown when the Orchids were prepared for the Flora of Tropical Africa the species was referred to *Mystacidium*, a position which now proves untenable. It is quite a distinct and isolated species, though perhaps most allied to *Angraecum Eichlerianum*, Kränzl. (Bot. Mag. t. 7813), which it closely resembles in habit, though the details of the flower are very different.

Mr. Dawe found the plant growing in a hot, moist, and shady situation, and under these conditions it has succeeded well in cultivation.

Descr.—A climbing epiphyte, 1–2 ft. high, with aerial roots. *Leaves* distichous, oblong, unequally bilobed, coriaceous, 4–5 in. long, an inch or more broad; sheaths tubular, clasping the stem, striate, 1-1½ in. long. *Peduncles* axillary, 2½–3 in. long, 1-flowered. *Bracts* ovate-oblong acute, about ⅓ in. long. *Flowers* large, pale yellow, except the lip, which is white with a green throat. *Sepals* and petals linear, acuminate, 2½–3 in. long; the petals and dorsal sepal reflexed, the lateral sepals diverging. *Lip* large, infundibular; limb broadly elliptical-ovate, apiculate, 2½–3 in. long, about 2 in. broad; throat infundibular, 2–2¼ in. long, then sharply reflexed into a slender somewhat curved spur, 3½–4½ in. long. *Column* very broad, about ¼ in. long, with rounded wings; pollinia 2, attached to a short, broad, and flat stipes.—R. A. Rolfe.

Fig. 1, column; 2, anther-cap; 3 and 4, pollinarium, seen from front and back:—*all enlarged.*

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Tab. 8154.

PODOPHYLLUM versipelle.

China.

Berberidaceae. Tribe Berbereae.

Podophyllum, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 45.

Podophyllum versipelle, *Hance in Journ. Bot.* vol. xxi. (1883) 362; *Hemsl. in Journ. Linn. Soc.* vol. xxiii. p. 33; *Hook. Ic. Plant.* vol. xx. (1891), t. 1996; affinis *P. pleiantho*, Hance, sed foliis altius lobatis et floribus minoribus differt.

Rhizoma perennis. *Caules* annui, erecti, glabri, pallide virides. *Folia* caulina 2, inferius longe, superius breviter centrice vel subcentrice peltato-petiolata, superius inflorescentiam terminalem et sessilem superans, ambitu orbicularia, plus minus profunde 5–9-lobata, usque ad 25 cm. diametro, supra glabra, subtus parce pilosa, nervis supra impressis subtus leviter prominulis, lobis ovatis vel ovato-oblongis vel interdum leviter trilobatis circ. 10 cm. longis et 8 cm. latis, marginibus subulato-denticulatis. *Cymae* umbelliformes, sessiles, saepius 8-florae. *Pedicelli* penduli, usque ad 5 cm. longi, apice leviter incrassati, glabri vel breviter pilosi. *Flores* saturate coccinei. *Sepala* 6, oblongo-elliptica, 1·5 cm. longa, ·7 cm. lata, obtusa, extus breviter pilosa, intus glabra. *Petala* 6, oblongo-elliptica, 2–2·5 cm. longa, ·75–1 cm. lata, obtusa, utrinque glabra. *Stamina* 6; filamenta complanata, 7 cm. longa, glabra; antherae circiter 1 cm. longae, connectivo incrassato apice obtuso. *Ovarium* ellipsoideum, glabrum; stylus brevis, stigmate magno peltato coronatus. *Ovula* indefinita. *Fructus* ignotus.

The genus *Podophyllum* consists of at least six species, five of which are in cultivation. One of these, *P. peltatum*, is a native of North America, whilst the remainder are found in India, China, and the island of Formosa. They are all sufficiently hardy to be grown in the open at Kew, but *P. pleianthum*, a native of Formosa, succeeds better when afforded a little protection from frost. *P. versipelle* somewhat resembles this species, the flowers being more hidden from view by the uppermost leaf. The plant from which our illustration was prepared was presented to Kew in 1903 by Messrs. J. Veitch & Sons, who introduced this species into cultivation through their collector, Mr. E. H. Wilson. It is found in the woods and ravines of Western China. *P. peltatum* (B. M. t. 1819), has been in cultivation for a very long period; as early as 1664, according to Evelyn, "Kalendarium," 1664, p. 67, as *Anapodophyllum*. It has white flowers, and is commonly

known as the May-Apple or American Mandrake. The leaves and root of this plant are poisonous, but the fruit is edible.

This species was first collected in fissures of rocks in the Lofau Mountains, Kwantung, by the Rev. B. C. Henry, and in barren places in the same region by the Rev. E. Faber and Mr. C. Ford; and it has since been collected in several localities in the Provinces of Hupeh and Szechuen, by Dr. A. Henry and Mr. E. H. Wilson.

Descr.—Rhizome perennial. *Stems* annual, erect, glabrous, pale green. *Cauline leaves* 2, lower long, upper shortly, centrally or subcentrally peltate, the upper one overtopping the terminal and sessile inflorescence, orbicular in outline, more or less deeply 5–9-lobed, largest 10 in. in diameter, glabrous above, sparsely pilose beneath; nerves impressed above, slightly prominent below; lobes ovate, ovate-oblong, or sometimes slightly trilobed, about 4 in. long and 3 in. broad, margins subulate-denticulate. *Cyme* umbelliform, sessile, often 8-flowered. *Pedicels* pendulous, up to 2 in. long, slightly thickened at the apex, glabrous or shortly pilose. *Flowers* deep crimson. *Sepals* 6, oblong-elliptic, $\frac{1}{2}$ in. long, $\frac{1}{4}$ in. broad, obtuse, shortly pilose outside, glabrous inside. *Petals* 6, oblong-elliptic, $\frac{3}{4}$–1 in. long, $\frac{1}{4}$–$\frac{1}{3}$ in. broad, obtuse, glabrous on both sides. *Stamens* 6, filaments flattened, $\frac{1}{4}$ in. long, glabrous; anthers about $\frac{1}{2}$ in. long, connective thick, obtuse at the apex. *Ovary* ellipsoid, glabrous; style short, stigma large, peltate. *Ovules* indefinite.—J. Hutchinson.

Fig. 1. margin of leaf; 2, anthers and pistil:—*all enlarged.*

M. S. del. J.N. Fitch lith.

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Tab. 8155.

BIGELOVIA graveolens.

North America.

Compositae. Tribe Asteroideae.

Bigelovia, *DC.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1232.

Bigelovia graveolens, *A. Gr. in Proc. Am. Acad.* 1873, vol. viii. p. 644; *Syn. Fl. N. Am.* vol. i. pt. 2, p. 139: inter affines ramis junioribus albo-tomentosis et pappo molli distinguitur.

Frutex in culto usque ad 3 m. altus. *Caulis* basi 5 cm. diametro, dense ramosus, ramulis ultimis corymbosis pendulis. *Folia* alterna, conferta, glabrescentia, crassiuscula, linearia, 3–7 cm. longa, acuta. *Capitula* homogama, discoidea, numerosissima, corymbosa, brevissime pedunculata, 5-flora, angusta, circiter 1·5 cm. longa. *Involucri* bracteae circiter 6-seriatae, lanceolatae, acutae, carinatae, scariosae, infimae minores, 2–3 mm. longae. *Flores* flavi. *Corolla* regularis, tubulosa, 5-striata, lobis suberectis vix acutis. *Antherae* exsertae, apice appendiculatae. *Styli rami* elongati, pubescentes, longe exserti, divaricati. *Achaenia* subcylindrica, hirsuta. *Pappi setae* numerosae, inaequales, longiores corollae tubum aequantes, molles, puberulae.—*Chrysocoma graveolens*, Nutt. Gen. N. Am. Pl. vol. ii. p. 136. *Linosyris graveolens*, Torr. & Gray Fl. N. Am. vol. ii. p. 234. *Chrysocoma nauseosa*, Pursh, Fl. Am. Sept. vol. ii. p. 517. *Chrysothamnus nauseosus*, Britton in Brit. & A. Br. Fl. N. U.S. & Can. vol. iii. p. 326 cum figura.

Bigelovia graveolens, as defined by A. Gray, is a very variable plant, of which he distinguishes five varieties, and he gives the height as 1 to 3 ft. Britton and Brown say 1 to 6 ft., and under cultivation, trained to a wall, grows considerably higher. At Kew it is grown against the wall at the north end of the Herbaceous ground, and it is pruned every season. At present the plant covers about 8 square yards, and it is very conspicuous when covered with its large clusters of bright yellow flower-heads. It has a wide range of distribution, extending from British Columbia to New Mexico, and it grows naturally in sterile and especially alkaline soils. Mr. W. Watson contributes the following notes:—"Kew is indebted to the Rev. Canon Ellacombe for this shrub. He sent a small plant for identification in 1900, and it has now stood four winters without protection. Last year it was in full flower in mid-October, and so continued about a month. It might be called a shrubby Golden Rod, the big crowded corymbose clusters of yellow flowers being

not unlike those of some of the Solidagos. The leaves have a strong aromatic odour, not unlike tansy. At Kew the plant requires the protection of a wall, but further south it would no doubt be quite hardy in the open. It is easily propagated from stem-cuttings, and it is quite the sort of shrub for collections of showy and interesting plants; its habit of flowering so late in the year giving it a special value. *B. Douglasi*, a smaller flowered species, is also cultivated at Kew."

Descr.—Shrubby, growing to at least 6 to 8 ft. high in cultivation. *Stem* as much as 2 in. in diameter at the base, much branched upwards; flowering branches corymbose, pendulous, tomentose, white. *Leaves* alternate, crowded, glabrescent, rather thick, linear, 1–3 in. long, acute. *Flower-heads* very numerous, corymbose, shortly stalked, 5-flowered, narrow, about $\frac{3}{5}$ in. long. *Bracts* of the involucre in about 6 series, lanceolate, acute, the lowest smallest, about $\frac{1}{6}$ in. long. *Flowers* yellow, all tubular. *Corolla* regular, 5-striped, lobes nearly erect, scarcely acute. *Style-branches* elongated, pubescent, much exserted, spreading. *Achenes* nearly cylindrical, hairy. *Pappus* of numerous, unequal bristles, the longest equalling the corolla-tube.—W. Botting Hemsley.

Fig. 1, a head of flowers; 2, a flower; 3, a bristle of the pappus; 4, anthers; 6, style-arms:—*all enlarged.*

M. S. del. J.N. Fitch lith

Vincent Brooks, Day & Son. Ltd. imp.

Tab. 8156.

PRUNUS Besseyi.

North-Western United States.

Rosaceae. Tribe Pruneae.

Prunus, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 609.

Prunus (§ Cerasus) **Besseyi,** *Bailey in Bull. Cornell Agric. Exp. Stat.* No. 70, p. 261 (1894); *Britton & Brown, Illustr. Flora N. United States,* vol. ii. p. 251, fig. 2019; *De Wild., Icon. Hort. Then.* vol. iii. t. 112; *Späth. in Gartenfl.* 1903, p. 551; *P. pumilae* et *P. cuneatae* arcte affinis, ab illa tamen habitu majus compressa foliisque basin versus latioribus, ab hac foliorum laminis firmulis petiolisque brevioribus et fructu majore satis recedit.

Frutex nanus, compactus, interdum prostratus, ·6–1·2 m. altus, omnino glaber. *Folia* decidua, elliptica, elliptico-lanceolata vel parum subobovata, 2·5–6 cm. longa, 1·5–1·75 cm. lata, margine basi cuneata nonnunquam integra excepta minute serrata, supra viridia, subtus pallidiora, utrinque hebetia, distincte petiolata; stipulae 3–4 mm. longae, serratae, *Flores* in fasciculos 2–4-floros ad ramulorum anni superioris nodos congesti, singuli 1·5 cm. lati, pedicellis floriferis 1·25 cm. longis. *Calyx* campanulatus, 5-lobus; lobis ovatis glanduloso-serratis demum reflexis. *Petala* ovato-oblonga, alba, 8 mm. longa, 5 mm. lata. *Drupae* late ovatae, 1·5 cm. longae, 1 cm. diam., primo pruinosae, purpurascentes, demum nigricantes; pedicelli fructigeri plus minusve refracti, 2 cm. longi.—*P. pumila*, var. *Besseyi*, Waugh; Bailey in Cyclop. of Amer. Hort. p. 1451 (1901).—D. Prain.

There are three dwarf Cherries of North America that constitute a well-marked and homogeneous group. They are *Prunus pumila*, L., *P. cuneata*, Raf., and *P. Besseyi*, Bailey. All three are known as "Sand-Cherries" in the United States, and in a strictly botanical sense can only be regarded as varieties of one species. Professor Bailey himself, in the *Cyclopedia of American Horticulture*, p. 1451 (1901), has adopted this view. In geographical distribution, *P. Besseyi* is the most western of the group, being found in the States of Colorado, Nebraska, Kansas, Utah, &c. It is a characteristic undershrub of the Nebraska sand-hills. *P. pumila* differs in its taller, less compact habit, and in its oblanceolate or spathulate leaves; and *P. cuneata* is distinguished by its smaller fruits, its longer petioles, and thinner leaves.

In the hot, dry plains east of the Rocky Mountains, *P. Besseyi* promises to become a valuable fruit-bearing shrub. It had already been cultivated to some extent in

Colorado, under the popular name of "Dwarf Rocky Mountain Cherry," previous to its recognition as a species by Prof. Bailey. The fruit is variable in quality, with a flavour comparable to that of a Morello Cherry. Cultivation and selection will, no doubt, eliminate whatever may be excessive in the bitterness and astringency of the wild fruits. Mr. C. E. Pennock, Fort Collins, Colorado, who was one of the first to detect the economic value of this Cherry, mentions, as evidence of its wonderful productiveness in that State, that he has picked sixteen quarts of fruit from a three-year-old bush, and eighty cherries from a branch 12 in. long. It will not be of any economic value in the British Isles, but it is worth the notice of fruit-growers in South Africa and Australia, or wherever the summer conditions approximate to those of Colorado.

The plant from which our figure was prepared is one of a batch sent to Kew by Professor Sargent, in 1900, from the Arnold Arboretum. They have flowered during the last three years, and in early May, when the growths of the preceding summer are crowded with fascicles of white flowers, make a charming display. The fruit has not, hitherto, been produced in sufficient abundance at Kew, to count among the ornamental qualities of the plant. The species is quite hardy.

Descr.—A dwarf, compact, sometimes prostrate shrub, 2–4 ft. high, deciduous, glabrous in every part. *Leaves* elliptic to elliptic-lanceolate or slightly obovate, 1–2½ in. long, serrate, or the basal part often entire, greyish green. *Stipules* subulate, serrate. *Fascicles* of 2 to 4 flowers produced in May at the nodes of the previous season's branches. *Flowers* ⅝ in. in diameter, on pedicels ½ in. long. *Calyx* green, 5-lobed; lobes ovate, glandular-serrate, finally reflexed. *Petals* white. *Drupes* on stout, more or less depressed pedicels, ¾ in. long, at first covered with a purplish bloom, black when quite ripe.—W. J. Bean.

Fig. 1, a partially expanded flower; 2, section through the receptacle; 3 and 4, anthers:—*all enlarged.*

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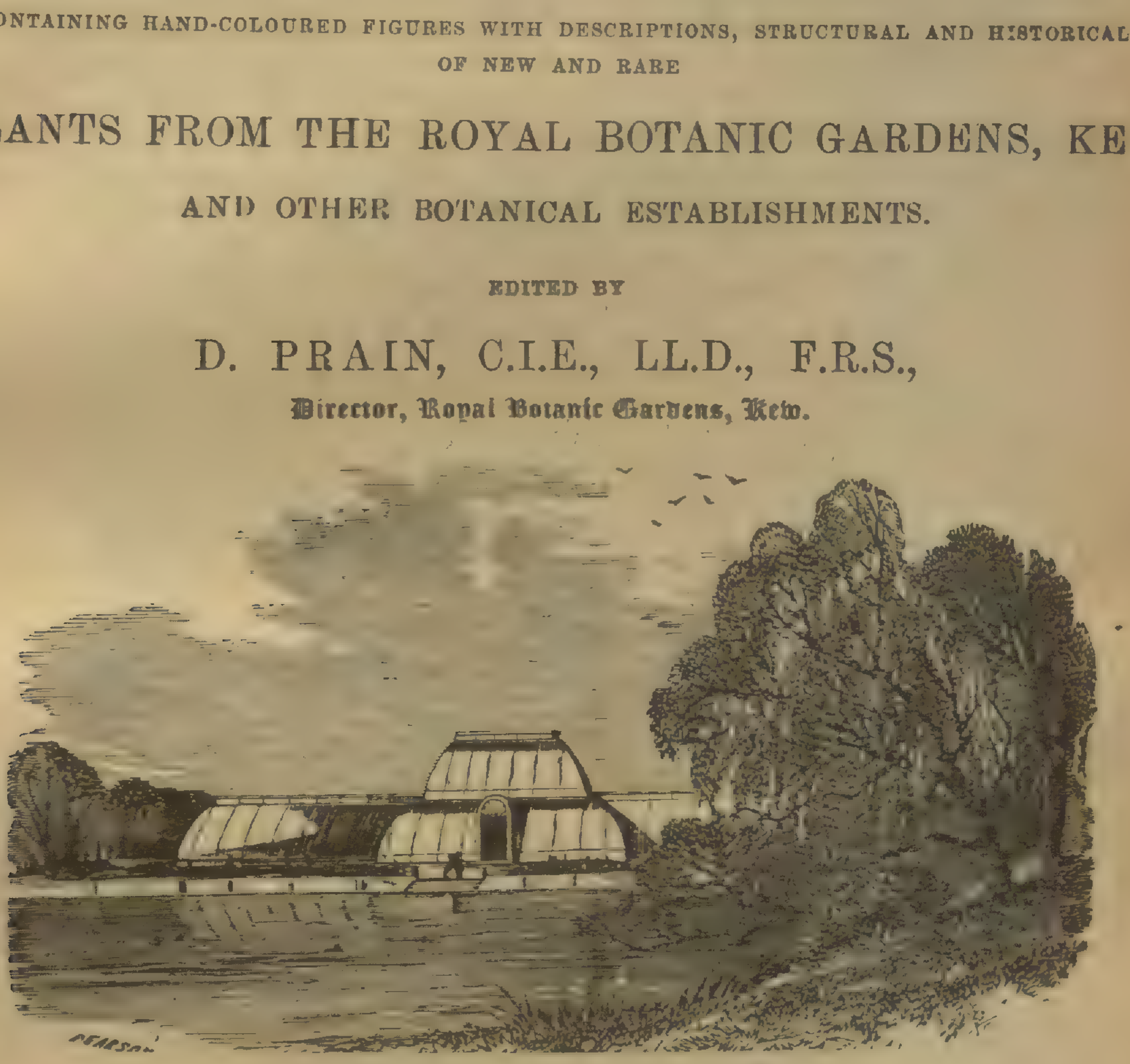

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Tab. 8157.

FERULA communis var. brevifolia.

Mediterranean Countries.

Umbelliferae. Tribe Peucedaneae.
Ferula, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 917.

Ferula communis, *Linn.*, var. **brevifolia,** *Mariz, in Bol. Soc. Brot.* vol. xii. (1895), p. 207; a typo foliorum segmentis ultimi ordinis brevioribus (interdum brevissimis) differt.

Herba perennis, gigantea, ad 3 m. alta, glaberrima, caule basi ad 10 cm. crasso. *Folia* ampla, laete viridia, pinnato-multisecta, laciniis ultimi ordinis tenuibus lineari-filiformibus, nunc 3–5 mm. nunc 10–20 mm. longis sed in eodem folio subaequalibus acutis; petioli foliorum basalium inferne longe dilatati, superiorum in vaginam amplam semiamplexicaulem abeuntes; vaginae summae subaphyllae. *Umbellae* compositae in thyrsum 1 m. vel ultra longum collectae, centrales breviter, laterales longiuscule pedunculatae, 16–24-radiatae, radiis subaequalibus 2–3 cm. longis, involucro nullo vel oligophyllo phyllis quam radiis multo brevioribus membranaceis lanceolatis. *Umbellulae* 20–(vel ultra) radiatae, radiis 5–8 mm. longis, involucello mono- vel diphyllo, phyllis linearibus vel setaceis brevibus. *Sepala* ad dentes minutos redacta. *Petala* ovato-oblonga, lutea, inflexo-acuminata, integra. *Styli* divergentes, demum reflexi. *Fructus* ambitu ellipticus vel obovato-ellipticus, a dorso valde compressus, 12–16 mm. longus, 7–11 mm. latus; mericarpia margine dilatato compresso cincta, jugis 3 dorsalibus filiformibus, lateralibus 2 in marginem immersis, vittis in valleculis 2–3, in commissura 4–6; carpophorum bipartitum. *Semina* plano-convexa.—*F. brevifolia*, Link in Roem. & Schult. Syst. Veg. vol. vi. p. 592 et in Hoffmansegg & Link, Flore Portug. p. 416, t. 108, *a*. *F. nodiflora*, Guss. Syn. Fl. Sic. vol. i. p. 353, non Linn. *F. nodiflora*, var. *monspeliensis*, Gren. & Godr. Fl. Franç., vol. i. p. 692. *F. Linkii*, Webb & Berth., Fl. Canar., Phyt. iii. p. 160, t. 75. *F. communis*, var. *nodiflora*, Fiori & Paol., Fl. Anal. d'Ital. vol. ii. p. 176.

The plant figured here was raised from a rootstock communicated by Vice-Consul G. P. Hunot, from Saffi, Marocco, in 1886, which flowered in December, 1892. It represents a form of *Ferula communis*, characterised by shorter ultimate leaf segments, which occurs along with the typical form almost throughout the area of the species. This area extends from the Canaries and Portugal to Constantinople and Syria, excluding North-east Africa. The leaf chosen for the accompanying plate represents a condition somewhat intermediate between the two forms, but in other leaves of the same individual plant the length of the ultimate segments varied from $\frac{1}{6}$ to $\frac{1}{3}$ of an inch.

October, 1907.

Similar and even greater variations are evident in another specimen of this plant, of unknown origin, which was grown at Kew as *Ferula Linkii*, but there is no doubt that specimens occur in which the ultimate segments of all the leaves are reduced to $\frac{1}{5}$ to $\frac{1}{2}$ of an inch. Such specimens were originally described as distinct species, e.g. *F. brevifolia*, Link, and *F. Linkii*, Webb & Berth. This form with short segments seems to prevail in certain localities and bears the character of a well-established race.

Particular interest attaches to this plant, for the problem of the origin of the gum ammoniac (Fashook) of Marocco has been solved owing to its successful cultivation at Kew. This gum was originally referred to *Ferula orientalis*, L., a plant confined to the Orient, and later on to *F. tingitana*, which is a native of Marocco. But the figure given by Jackson, *Account of Marocco*, ed. 3, p. 136, t. 7, of the leaf of the Fashook plant made this identification very doubtful. Sir Joseph Hooker, and afterwards Sir William Thiselton-Dyer, therefore enlisted the services of Mr. G. P. Hunot, then British Vice-Consul at Saffi, amongst others, to procure authentic specimens of the plant yielding the Fashook gum, with the result that its source is now traced to *Ferula communis*. A full account of the history of the drug will be given shortly in the *Kew Bulletin*.

Descr.—A herb, sometimes 10 feet high, quite glabrous. *Stem* 4 in. thick at the base. *Leaves* bright green, very large, much dissected, ultimate segments linear-filiform, $\frac{1}{8}$–$\frac{4}{5}$ in. long, lower petioles widened at the base, upper replaced by large sheaths. *Umbels* compound in a thyrse, 3 feet or more long, the central shortly, the lateral longer peduncled, with 16–24 rays about 1 in. long and with or without an involucre of a few short membranous leaves. *Umbellules* of 20 or more rays, $\frac{1}{5}$–$\frac{1}{3}$ in. long; involucel of 1 or 2 linear or filiform short leaves. *Petals* ovate-oblong, entire, yellow with an inflexed tip. *Styles* at length reflexed. *Fruit* elliptic or obovate-elliptic, dorsally very much compressed, $\frac{1}{2}$–$\frac{2}{3}$ in. long, $\frac{1}{4}$–$\frac{1}{2}$ in. broad; mericarps with 3 filiform dorsal ridges and a narrow thickened margin; intrajugal oil-tubes 2–3; commissural oil-tubes 4–6; carpophore bipartite. *Seed* plano-convex.—Otto Stapf.

Cultiv.—The plant raised from the rootstock presented by Mr. G. P. Hunot in 1886 has been cultivated in a pot in

a greenhouse, except during summer, when it has stood in the open air exposed to full sunshine. The leaves have always died in the autumn and new ones have started in winter, but no flowers were developed except in December, 1892, when the present figure was made. Like the ordinary state of *Ferula communis*, this variety is a highly ornamental plant even when it is not in flower. Although the Kew plant has received glass-house treatment, it is possible that it would thrive out of doors, as typical *Ferula communis* does, but it has not been tried owing to the time of year when the new leaves are developed. The soil used for it is a sandy peat, and whilst the plant is at rest it is kept quite dry. The plant is one that ought to thrive in countries such as the Cape of Good Hope and California.—W. Watson.

Fig. 1, male flower; 2, hermaphrodite flower; 3 and 4, fruits (semimature); 5, cross-section through a carpel; 6, cross-section through a semimature fruit; 7, whole plant:—1–6, *enlarged*; 7, *reduced*.

M.S del J.N.Fitch lith

Vincent Brooks, Day & Son Lt.d imp

L. Reeve & Co. London.

Tab. 8158.

ROSA Soulieana.

Western China.

ROSACEAE. Tribe ROSEAE.

ROSA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 625.

Rosa (§ Systylae) **Soulieana**, *Crépin in Bull. Soc. Bot. Belg.* 1896, vol. xxxv. *Comptes Rendus*, p. 21; species *R. moschatae*, Mill., proxima; differt foliis minoribus, foliolis ovalibus utrinque rotundatis, pedunculis minus glandulosis et sepalis breviter acuminatis.

Frutex robustus, habitu *R. caninae*, 2–3 m. altus, aculeis rectis vel in ramis floriferis curvatis basi latis crebre armatus, praeter glandulas parvas breviter stipitatas glaber. *Folia* pallide viridia, 5–9-foliolata, plerumque 7-foliolata, maxima 10 cm. longa sed saepius 6–8 cm. longa. *Foliola* ovalia, ovata vel ovato-oblonga, interdum usque ad 3 cm. longa, brevissime petiolulata, minute serrulata; rhachis aculeolata. *Stipulae* latae, adnatae, minute glanduloso-marginatae, parte libera acutae. *Flores* eburnei, circiter 4 cm. diametro, in corymbos compositos amplos densos terminales dispositi, vel interdum in ramis brevibus lateralibus solitarii; pedunculi graciles, glandulis minimis instructi. *Calyx* inconspicue glandulosus; lobis breviter acuminatis integris vel paucidentatis. *Petala* emarginata. *Ovaria* pilosa, stylis persistentibus. *Fructus* ovoideus vel fere globosus, circiter 1·5 cm. diametro maximo, aurantiaco-cinnabarinus.

Rosa Soulieana is one of the most desirable of the single white roses, both in flower and fruit. Kew received it from Messrs. de Vilmorin in 1899, and it may be seen to great advantage in the Rose Valley near the Pagoda. It differs from *R. moschata* in the smaller leaves, usually oval leaflets rounded at both ends, shortly stalked glands on the peduncles and in the shorter tails of the sepals.

R. Brunonii, Lindl. (B.M. t. 4030) often erroneously written *Brunonis*, and quoted as a synonym of *R. moschata*, Mill., is easily distinguished by its very hairy peduncles. There are wild specimens of this species in the Kew Herbarium from various localities in the province of Kwangtung. In foliage it is much nearer *R. Soulieana* than it is to *R. moschata*.

On the authority of the late Professor Crépin, in *Bull. Soc. Bot. Belg.*, 1905, vol. xxxiv. *Comptes-Rendus*, p. 57, the plant figured in the *Magazine* (t. 7421) as *R. Luciae*, Franch. et Rochebr., is not that species, but is his *R.*

Wichuraiana. On the other hand, the plant described by Bentham, *Fl. Hongk.*, p. 106, under the name of *R. moschata* is *R. Luciae*.

Descr.—A very robust species of suberect habit, forming bushes at least 8 ft. high and as much through, armed with curved prickles or with straight ones in the barren branches. *Leaves* pale-green, usually with seven leaflets, the largest 4 in. long, usually 2½ to 3 in. long. *Leaflets* oval, ovate or ovate-oblong, rarely more than 1 in. long, minutely serrate, axis usually furnished with a few small prickles. *Stipules* adnate, acute, with marginal glands. *Flowers* ivory-white, about 1½ in. across, very numerous, in compound, dense, terminal corymbs, or sometimes solitary on short lateral branchlets. *Peduncles* slender, slightly glandular. *Calyx-lobes* shortly tailed, entire or furnished with a few small teeth. *Petals* emarginate. *Ovaries* pilose; styles connate. *Fruit* orange-vermilion, ovoid or nearly globose, a little over ½ in. in its greatest diameter.—W. Botting Hemsley.

Cultiv.—One of the most vigorous of all Roses, this new Chinese species is, in consequence, better adapted for semi-wild places than it is for the more trimly kept parts of the garden. On young plants the growths of a single year are sometimes 10 feet to 12 feet long. In June, when its numerous clusters of white flowers are open, it is very beautiful, as it is again in autumn, when the clusters of small fruits have turned to a soft red. But apart from these, the luxuriant mass of smooth grey foliage out of which are thrust the long, arching shoots of the year, is in itself attractive. Roses are notoriously gross feeders, and *R. Soulieana* is not one of the exceptions. It should be planted in good, rather heavy loam, in a position fully exposed to the sun, with abundant space to grow in.—W. J. Bean.

Fig. 1, portion of a flowering-branch showing the prickles; 2, longitudinal section of a receptacle; 3, a young carpel:—*all enlarged*.

M.S del. J.N Fitch lith.

Vincent Brooks, Day & Son Lith.

L Reeve & C° London.

Tab. 8159.

IRIS verna.

United States.

Iridaceae. Tribe Moraeae.

Iris, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 686.

Iris (Pardanthopsis) **verna**, *Linn. Sp. Pl.* ed. 1. p. 39 : *Ait. Hort. Kew.* ed. 1, vol. i. p. 73; *Lodd. Cab.* t. 1855; *Sweet, Brit. Fl. Gard.* ser. 1, t. 68; *Britt. & Brown, Ill. Fl. N. U. S.* vol. i. p. 452; a speciebus reliquis hujus sectionis foliis linearibus scapoque unifloro differt.

Herba acaulis. *Radix* fibrosa. *Folia* linearia, 15–20 cm. longa, 6 mm. lata. *Scapus* uniflorus; spathae 5–6 cm. longae, lanceolatae, virides; pedicelli breves. *Perianthii tubus* viridis, violaceo-tinctus, 4 cm. longus; segmenta exteriora oblanceolata, acuta, imberbia, dilute violacea, 4 cm. longa, 1 cm. lata; ungues aurantiaci; segmenta interiora oblanceolata, acuta, violacea, 3 cm. longa, 1 cm. lata. *Styli rami* 2 cm. longi; cristae 8 mm. longae, 3 mm. latae.—*I. virginiana pumila, sive Chamaeiris verna angustifolia, flore purpureo-caeruleo odorato*, Pluk. Almag. p. 198; Phytogr. t. 196, f. 6.

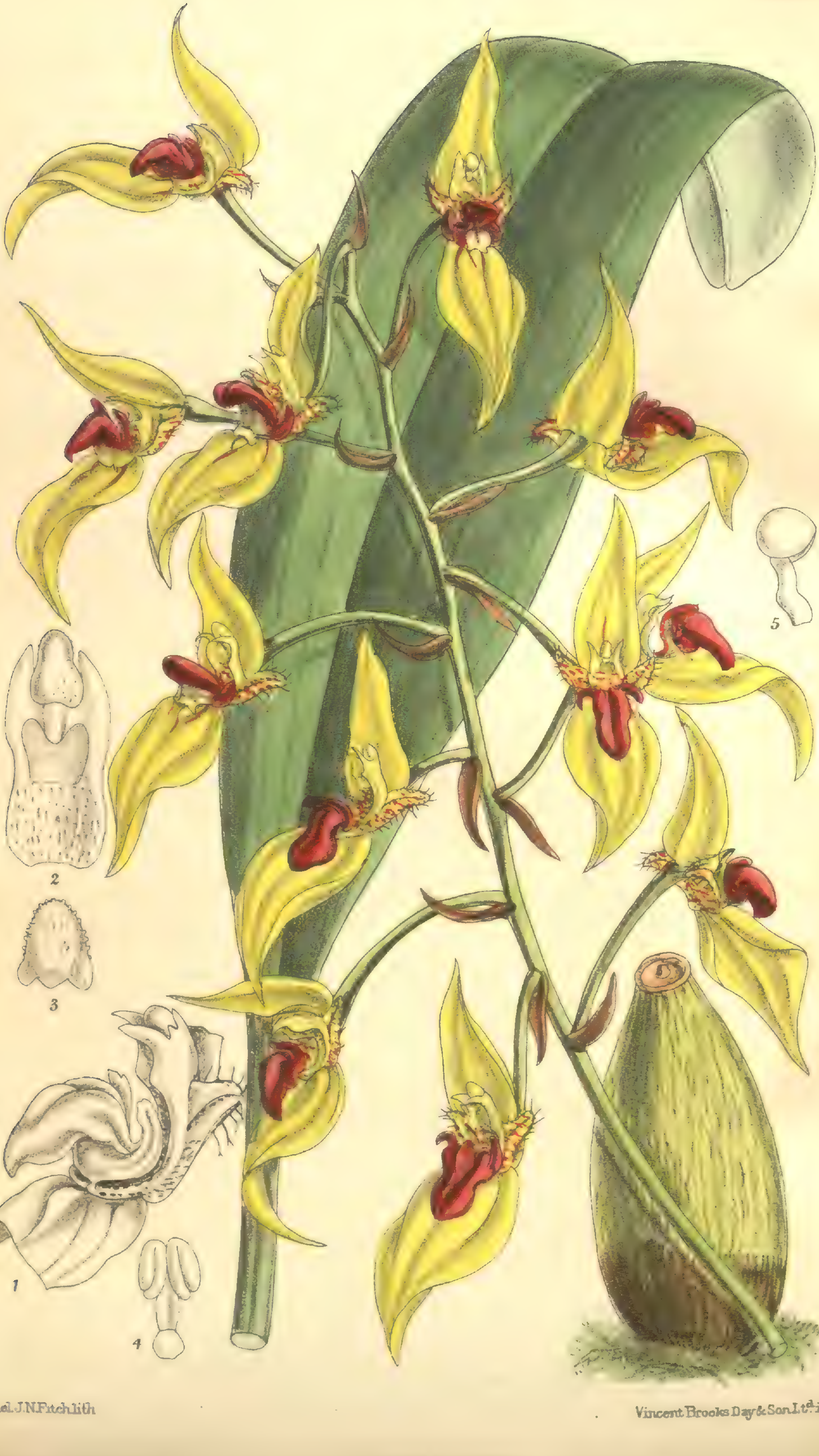
Although *Iris verna* was cultivated by Philip Miller as long ago as 1739, and has been re-introduced from time to time, it has never become a familiar plant in English gardens. This may be due to its having been confused by some of the earlier botanical and horticultural writers with the well-known and popular *Iris cristata*, but in that species the outer perianth lobes are crested, whereas in *I. verna* they are naked. The home of *I. verna* is in the Eastern States of North America, from Pennsylvania to Virginia, Kentucky, and Georgia. *I. cristata* is figured in this work at t. 412.

Descr.—A stemless herb with fibrous roots. *Leaves* linear, finely veined, 6–8 in. long, $\frac{1}{2}$ in. broad. *Stem* none. *Scape* 1-flowered; spathes 2–$2\frac{1}{2}$ in. long, lanceolate, green; pedicels short. *Perianth-tube* green tinted with violet, $1\frac{1}{2}$ in. long; falls oblanceolate, acute, glabrous, pale violet, $1\frac{1}{2}$ in. long, $\frac{3}{8}$ in. broad; claws orange; standards oblanceolate, acute, violet, $1\frac{1}{4}$ in. long, $\frac{3}{8}$ in. broad. *Style* arms $\frac{3}{4}$ in. long; crests $\frac{1}{4}$ in. long, $\frac{1}{8}$ in. broad.—T. F. Chipp.

Cultiv.—The specimen figured was forwarded by Mr. R. I. Lynch, A.L.S., Curator of the Botanic Gardens, Cambridge, with the explanation that it had been grown under glass.

At Kew also it is cultivated in pots in a cold frame and exhibited when in flower, usually in April, in the Alpine House; for, although it is hardy and grows quite freely out of doors both in the rock-garden and in the *Iris* beds, it rarely flowers there. In this respect it differs from the remaining members of the *Pumila* section, to which it belongs, as they flower profusely in the open air every spring. Probably *I. verna* would be more at home in the warmer parts of England, such as South Devon and Cornwall. The flowers are fragrant.—W. Watson.

Figs. 1 and 2, anthers; 3, stigma:—*enlarged.*



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Tab. 8160.

BULBOPHYLLUM DICHROMUM.

Annam.

Orchidaceae. Tribe Epidendreae.

Bulbophyllum, *Thouars*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 501.

Bulbophyllum dichromum, *Rolfe in Kew Bulletin*, 1907, p. 128; a *B. fusco-purpureo*, Wight, sepalis lateralibus apice connatis et petalis brevibus ciliatis nec longe setiferis differt.

Herba epiphytica. *Rhizoma* validum. *Pseudobulbi* ovoideo-oblongi, obscure tetragoni, circa 5 cm. longi, monophylli. *Folia* petiolata, coriacea, oblonga, obtusa, circa 17 cm. longa, 4·5 cm. lata; petiolus 5 cm. longus. *Scapus* suberectus, circa 25 cm. longus, basi vaginis oblongis subobtusis tectus; racemus laxus, circa 12-florus. *Bracteae* ovato-oblongae, acutae, 8–10 mm. longae. *Pedicelli* subgraciles, 2·5–3 cm. longi. *Flores* speciosi, vitellini, labello purpureo. *Sepalum* posticum ovato-oblongum, subacutum, concavum, 2 cm. longum; sepala lateralia lanceolata, acuta, apice connata et leviter recurva, facie minutissime puberula. *Petala* patentia, oblique triangularia, breviter acuminata, ciliata, 4 mm. longa, basi latissima, columnae pedi adnata. *Labellum* carnosum, trilobum, 8 cm. longum; lobi laterales oblongi, recurvi, 3 mm. longi, apice denticulati; lobus intermedius recurvus, late oblongus, obtusus, convexus, minutissime papillosus, 5 mm. longus; discus bicarinatus, profunde canaliculatus. *Columna* latissima, 5 mm. longa, alis crassis acutis; pes 5 mm. longus.

Bulbophyllum is a large and remarkably polymorphic genus, extending throughout the tropics of both hemispheres. Upwards of five hundred species have already been described, and although the great majority are not sufficiently attractive for general cultivation, there are numerous striking exceptions. Already more than twenty species have been figured in the *Botanical Magazine*, several of them being very remarkable in character. *B. Beccarii*, Reichb. f. (t. 6567), a Bornean species, is the giant of the genus; it has an odour that is extremely disagreeable. *B. grandiflorum*, Blume (t. 7787), a native of New Guinea, is equally remarkable for the size of its individual flowers. *B. barbigerum*, Lindl. (t. 5288), a native of West Tropical Africa, is remarkable for its large hairy lip, so delicately balanced as to oscillate in the slightest breeze. *B. lemniscatum*, Lindl. (t. 5961), a native of Burma, has a long club-shaped appendage suspended from the back of each

sepal, and is quite unique in structure. *B. Weddellii*, Reichb. f. (t. 7958), from Brazil, has a very curiously marked and delicately mobile lip. Other interesting peculiarities characterize *B. auricomum*, Lindl. (t. 7938), *B. comosum*, Coll. & Hemsl. (t. 7283), *B. macranthum*, Lindl. (t. 7208), *B. Ericssoni*, Kränzl. (t. 8088), *B. crenulatum*, Rolfe (t. 8000), *B. reticulatum*, Batem. (5605), and *B. Dayanum*, Reichb. f. (t. 6119).

The species now figured, if less remarkable in structure than several of the preceding, is more showy in colour, and promises to be a very attractive garden plant, the dark purple lip forming a striking contrast to the bright yellow sepals and petals, while the inflorescence is very graceful. It was introduced by Messrs. Sander & Sons, St. Albans, about two years ago, and flowered at the Royal Botanic Garden, Glasnevin, in February last, when it was sent to Kew for determination by Mr. F. W. Moore, A.L.S.

Descr.—An epiphytic herb with stout woody rhizome. *Pseudobulbs* ovoid-oblong, obscurely 4-angled, about 2 in. long, 1-leaved. *Leaves* stalked, coriaceous, oblong, obtuse, about 6 in. long, $1\frac{3}{4}$ in. broad; petiole 2 in. long. *Scape* suberect, 9–10 in. long, with 2 or 3 oblong, obtuse sheaths at the base; raceme lax, about 12-flowered. *Bracts* ovate-oblong, acute, $\frac{1}{3}$ in. long. *Pedicels* rather slender, 1 in. or more long. *Flowers* conspicuous, deep yellow with a dark purple lip. *Dorsal sepal* ovate-oblong, subacute, concave, $\frac{3}{4}$ in. long; lateral sepals lanceolate, acute, connate at the apex and slightly recurved, minutely puberulous on the face. *Petals* spreading, obliquely triangular, shortly acuminate, ciliate, $\frac{1}{6}$ in. long, base very broad, adnate to the foot of the column. *Lip* fleshy, 3-lobed, $\frac{1}{3}$ in. long; side-lobes oblong, recurved, $\frac{1}{8}$ inch long, denticulate at the apex; front-lobe recurved, broadly oblong, obtuse, convex, minutely papillose, $\frac{1}{5}$ in. long; disc with two keels separated by a deep channel. *Column* broad, $\frac{1}{5}$ in. long; wings fleshy, acute; foot $\frac{1}{5}$ in. long.—R. A. Rolfe.

Fig. 1, flower, with sepals partly removed; 2, column; 3, anther-cap; 4 and 5, pollinia:—*all enlarged.*

M. S del, J.N. Fitch lith.

Vincent Brooks, Day & Son Lith. Imp.

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Tab. 8161.

PAEONIA Cambessedesii.

Balearic Islands and Corsica.

RANUNCULACEAE. Tribe PAEONIEAE.

PAEONIA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 10.

Paeonia Cambessedesii, *Willk. Illustr. Fl. Hisp. et Ins. Balear.* vol. i. p. 104, t. 65 a; affinis *P. corallinae*, Retz, sed foliis subtus pulchre purpurascentibus et carpellis erectis glabris purpurascentibus differt.

Perennis, herbacea, circiter 0·5 m. alta, caulibus glabris erectis flexuosis simplicibus sulcatis unifloris. *Folia* ternato-pinnatisecta; segmenta ovato-lanceolata vel oblonga, acuta, integra, glabra, supra intense viridia, subtus purpurascentia, nervis utrinque distinctis supra impressis subtus leviter elevatis. *Flores* rosei, solitarii, erecti, circiter 9 cm. diametro. *Sepala* inaequalia, viridia. *Petala* 5–10, rosea, late obovata, membranacea, marginibus crenulata. *Stamina* numerosa, filamentis purpureis, antheris flavis. *Carpella* 5–7, erecta, demum divergentia, glabra, purpurea, nitida, stigmate recurvato.—*P. corallina*, var. *fructibus glabris*, Cambess. Enum. Pl. Balear. p. 33; Costa Fl. de Catal. p. 9; Rodrigu Catal. Pl. Men. p. 2 et 100; Mares et Vigin. Catal. Rais. Pl. Balear. p. 12.—*P. corallina*, var. *Cambessedesii*, Willk. Oesterr. Bot. Zeitschr. et Ind. Pl. Vasc. Balear. in Linnaea, vol. xl. p. 133; Barcelo, Flora de las Balear. p. 18.

There are two distinct sections of *Paeonia* in cultivation, both of which are exceedingly ornamental and useful for garden purposes. The well-known Moutan, or Tree Paeony, *P. Moutan*, Sims, is the only representative of one section, whilst the other consists of numerous herbaceous species.

About twenty-five species are recognised in the genus; all are natives of Europe and Asia, except *P. Brownii*, Dougl., a relatively inconspicuous species, which inhabits Western North America from San Bernardino, in California, to British Columbia.

P. Cambessedesii is a native of the Balearic Islands and Corsica, and we are indebted to Miss Frances Geoghegan, of Glasnevin, Dublin, for the introduction of this pretty species to cultivation. It was collected by her in the Island of Majorca, where it was found in 1896, growing in a rocky, almost inaccessible spot on Cape Formentor. Our drawing was made from an offset of Miss Geoghegan's original plant, which flowered in April of the present year,

in the Royal Botanic Gardens, Glasnevin. *P. corallina*, Retz, its nearest ally, differs in having glaucous-green, never purple, leaves, and hairy carpels.

Descr.—A herbaceous perennial, usually about a foot and a half high. *Stems* glabrous, erect, flexuose, simple, one-flowered. *Leaves* ternately pinnatisect; segments ovate-lanceolate or oblong, acute, entire, glabrous, deep-green above, purple below; nerves distinct on both sides, impressed above, slightly elevated below. *Flowers* deep rose-pink, solitary, erect, usually about three and a half inches in diameter. *Sepals* unequal, green. *Petals* five to ten, broadly obovate, membranous, crenulate. *Stamens* numerous; filaments purple; anthers yellow. *Carpels* five to seven, erect, at length divergent, glabrous, purple, shining; stigma recurved.—J. Hutchinson.

Cultiv.—As a garden plant *P. Cambessedesii* has the same claims as *P. officinalis*, *P. peregrina*, *P. corallina* and the other species of the herbaceous section which are now represented in gardens by a host of hybrid and seedling forms. For its cultivation the treatment that answers for these, a rich deep soil and a fair amount of moisture, will be found suitable. It is perhaps not generally understood that herbaceous Paeonies will grow almost as well under the partial shade of trees as they do in the open, exposed to full sunshine. They are therefore serviceable for grouping along with hardy ferns and the like.—W. Watson.

Figs. 1 and 2, stamens; 3, young carpel; 4, ripe fruit:—1–3, *enlarged*; 4, *natural size.*

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Tab. 8162.

ARCTOTIS DECURRENS.

South Africa.

COMPOSITAE. Tribe ARCTOTIDEAE.

ARCTOTIS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 458.

Arctotis decurrens, *Jacq. Hort. Schoenb.* vol. ii. p. 20, t. 165; *Ait. Hort. Kew.* 1813, vol. v. p. 172; *Harv. & Sond. Fl. Cap.* vol. iii. pp. 452, 457; *Gard. Chron.* 1901, vol. xxix. p. 214; species ex affinitate *A. angustifoliae,* Linn., a qua bracteis involucratis glabris vel ciliatis et ligulis superne albis differt.

Herba pilosa, 60–90 cm. alta. *Folia* inferiora lyrata, parce pilosa, subamplexicaulia, 30–40 cm. longa, 5–7 cm. lata; lobi integri, terminales obtusi, marginibus venisque subtus arachnoideo-tomentosis; superiora sessilia, plus minusve integra, lanceolata, acuta, parce pilosa. *Capitula* solitaria, 8 cm. diametro. *Bracteae* involucri herbaceae, adpressae; exteriores oblongae, in caudam longam villosam attenuatae; interiores obtusae, glabrae vel ciliatae. *Flores radii* supra albi, basim versus atropurpureo-maculati, subtus purpureo-rubri. *Flores disci* 5-dentati; dentes atropurpurei; tubus luteus. *Achaenia* (immatura tantum visa) oblonga, basi acuta et pilis longis sericeis densissime instructa. *Paleae* pappi oblongae, obtusae, undulatae, hyalino-purpurascentes.

We are indebted for specimens of this fine species of *Arctotis* to Mr. W. E. Gumbleton, of Belgrove, Queenstown, Ireland, who also furnished the specimens of *Arctotis Gumbletoni*, figured in t. 7796. Writing in the *Gardeners' Chronicle* in 1901, Mr. Gumbleton states that from a packet of seeds sent him from Namaqualand, he only succeeded in getting one to germinate. This plant, however, has flourished, and has bloomed for the sixth time this year. In a recent letter, Mr. Gumbleton states that though the plant blooms freely, it has not yet produced mature seeds. He has tried by using its pollen, which it has produced abundantly, to fertilise *A. aspera*, so far without success.

Arctotis decurrens was originally introduced into this country from the Cape, in 1794, and is mentioned by Aiton in the *Hortus Kewensis* as being in cultivation at Kew in 1813. It is to be hoped that Mr. Gumbleton will shortly be successful in obtaining mature seeds, as a species so

distinct and ornamental certainly deserves to resume the place it formerly held in our gardens.

Descr.—A herbaceous perennial 2–3 feet high, densely pilose towards the top of the peduncles. *Lower leaves* lyrate, sparsely pilose, 12–16 in. long, 2–2½ in. broad; lobes entire, obtuse, margins and undersurface of the veins woolly. *Upper leaves* sessile, more or less entire, lanceolate, acute, sparsely pilose. *Flower-heads* solitary, 3 in. in diameter; involucral bracts herbaceous, appressed, outer ones oblong, tapering into a long villous point, inner ones obtuse, glabrous or ciliate. *Ray flowers* white above, with a dark purple spot towards the base, reddish purple underneath. *Disk-flowers* 5-dentate; teeth dark purple; tube yellow. *Achenes* (immature only seen) oblong, acute, furnished at the base with a dense tuft of long, silky hairs. *Scales* of the pappus obtuse, undulate, transparent, purple in the centre.—T. F. Chipp.

Cultiv.—This handsome plant is a useful addition to the several species of *Arctotis* which are grown in pots for the decoration of the greenhouse in winter and spring, namely, *A. aspera*, *A. aureola* and *A. revoluta*. These form shrubs, the tallest 6 feet high, and with a little management they become well furnished with branches which flower freely. They are propagated by means of cuttings and grow vigorously, reaching 4 to 6 feet in height in about two years. They thrive in a loamy soil, enjoying plenty of water at the root, except in winter, when water must be given sparingly. Like most of the plants of the order, they require plenty of sunshine; the flowers close in dull weather.—W. Watson.

Fig. 1, a ray-flower; 2, pappus-scales; 3, an outer disk-flower; 4, pappus-scale of the same; 5, anthers; 6, style-arms; 7, an intermediate disk-flower; 8, disk-flower from centre:—*all enlarged.*

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Tab. 8163.

RHODODENDRON INTRICATUM.

China.

Ericaceae. Tribe Rhodoreae.

Rhododendron, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron (Osmothamnus) **intricatum**, *Franch. in Journ. de Bot.* 1895, vol. ix. p. 395; *Hemsl. in Gard. Chron.* 1907, vol. xli. p. 262, f. 111; inter species sinenses hujus sectionis staminibus inclusis *R. thymifolio*, Maxim., proxima, ab eo tamen differt imprimis floribus majoribus saepissime quinatis.

Frutex densissime ramosus, demum 10–30 cm. altus, sed plantae cultae 10–15 cm. altae jam florentes. *Rami* primum ferrugineo-squamosi. *Folia* persistentia, crassa, breviter petiolata, ovali-oblonga vel interdum fere orbicularia, cum petiolo 0·5–1 cm. longa, utrinque densissime lepidota, subtus alba. *Perulae* trimorphae, ciliatae, exteriores fere orbiculares, intermediae spathulatae, exterioribus longiores, interiores lineares. *Corymbi* terminales saepissime 5-flori. *Flores* brevissime pedunculati, violacei vel lilacini, antheris aurantiacis, circiter 2 cm. diametro. *Calycis dentes* brevissimi, inaequales, triangulares, parce lepidoti. *Corollae tubus* brevis, intus puberulus; lobi aequales, oblongi, rotundati, patentes, leviter undulati. *Stamina* 10, corollae tubum vix excedentia. *Ovarium* lepidotum; stylus glaber, quam stamina dimidio brevior. *Capsula* circiter 0·5 cm. longa.—*Rhododendron nigro-punctatum*, Hort., Gard. Chron. 1907, vol. xli. p. 225; Journ. Hort. 3rd series, 1907, vol. liv. p. 343 cum fig., non Franch.

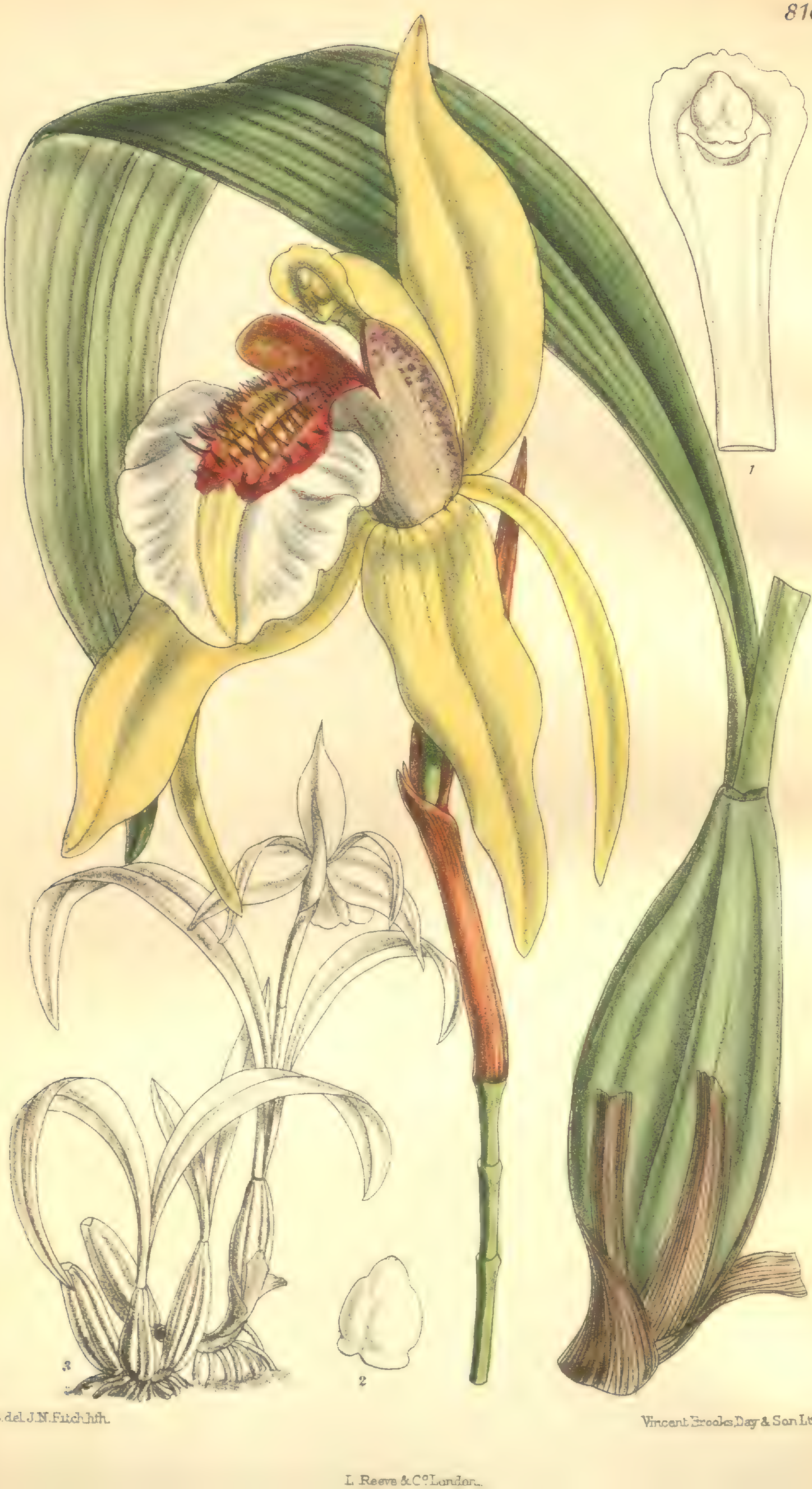
Nearly a score of species of *Rhododendron* belonging to the section *Osmothamnus* have been collected in China, and at least half-a-dozen of these are closely allied to *R. intricatum*, and are with difficulty distinguished in the dried state. In foliage, especially, the resemblance is very strong; but they differ, some in having solitary flowers, some in having long, exserted stamens, and in other not very obvious characters. The species here figured was at first taken to be *R. nigro-punctatum*, Franch., and Messrs. James Veitch and Sons, to whom Kew is indebted for the plant from which the present figure has been made, were awarded a First Class Certificate for it under that name at a meeting of the Royal Horticultural Society on April 2 of the present year. Subsequently Prof. H. Lecomte kindly lent to Kew the types of the numerous species described by the late Mr. A. Franchet, and has thus made it possible to identify our plant with *R. intricatum*.

November, 1907.

Descr.—A dwarf, densely branched shrub, flowering when only 4 to 6 in. high, though eventually attaining, under favourable conditions, a height of 18 in. *Branches* at first clothed with red-brown scales. *Leaves* persistent, thick, shortly stalked, oval-oblong or sometimes almost orbicular, $\frac{1}{6}$ to $\frac{1}{3}$ in. long, densely scaly on both sides, white beneath. *Scales* of the inflorescence trimorphic, fringed; outer almost orbicular; intermediate spathulate, longer than the outer; inner linear. *Trusses* terminal, usually 5-flowered. *Flowers* very shortly stalked, violet or lilac with orange-coloured anthers, about $\frac{4}{5}$ in. across. *Calyx-teeth* very short, unequal, triangular, sparsely scaly. *Corolla-tube* short, hairy within; lobes equal, oblong, rounded, spreading, slightly undulate. *Stamens* 10, scarcely exceeding the corolla-tube. *Ovary* scaly; styles smooth, half as long as the stamens. *Capsule* about $\frac{1}{5}$ in. long.—W. Botting Hemsley.

Cultiv.—This new Chinese species promises to be a most valuable acquisition. The dwarf alpine Rhododendrons introduced from North India have not proved of much value in Great Britain, being too tender and uncertain in any but the milder parts of the kingdom. *R. intricatum*, from its behaviour at Coombe Wood, is evidently hardier than the Indian forms; and of its beauty ample evidence was afforded by the group of plants exhibited at the Horticultural Hall last spring by Messrs. Veitch. It will no doubt thrive in soils similar to those that have been found to suit its congeners from North India—either peat and sand, or a sandy loam with peat added. The neat low habit of the plant points to its suitability for the rockery and alpine garden. It will also be a charming addition to the Ericetum, where it can be associated with other members of the family similar in habit.—W. J. Bean.

Fig. 1, a leaf, showing the under surface; 2, a scale from the same; 3, an outer scale of the inflorescence; 4, an inner scale of the inflorescence; 5, calyx and pistil; 6, part of corolla and stamens; 7, stamen:—*all enlarged.*



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Tab. 8164.

COELOGYNE Lawrenceana.

Annam.

Orchidaceae. Tribe Epidendreae.
Coelogyne, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 518.

Coelogyne Lawrenceana, *Rolfe in Gard. Chron.* 1905, vol. xxxvii. p. 227; *Gard. Mag.* 1905, p. 354, cum ic.; *Orch. Rev.* 1906, p. 39; a *C. speciosa*, Lindl., scapo terminali multo longiore et labelli carinis fimbriatis differt.

Herba epiphytica. *Rhizoma* validum. *Pseudobulbi* ovoideo-oblongi, 5–7 cm. longi, 2·5–3 cm. lati, diphylli. *Folia* lanceolata, acuminata, basi attenuata, 20–27 cm. longa, circa 3 cm. lata. *Scapi* terminales, 17–20 cm. longi, uniflori. *Bracteae* spathaceae, lanceolatae, striatae, 3–5 cm. longae. *Pedicelli* circa 4 cm. longi. *Flores* speciosi. *Sepala* patentia, lanceolato-oblonga, subacuta, dorso carinata, 5–7 cm. longa, 2–2·5 cm. lata, flava. *Petala* patentia, linearia, acuta, 5–7 cm. longa, 4–5 mm. lata, flava. *Labellum* trilobum, 5–6 cm. longum, basi subsaccatum; lobi laterales erecti, oblongi, obtusi, 3 cm. longi, brunnei; lobus intermedius recurvus, late ovatus, apiculatus vel obtusus, undulatus, circa 3–3·5 cm. latus, albus, infra apicem sulphureus; discus brunneus, apice tricarinatus, basi quinque-cristatus. *Columna* clavata, incurva, circa 4 cm. longa, apice alata.

This handsome *Coelogyne* was discovered by Mr. W. Micholitz when collecting in Annam for Messrs. Sander & Sons, St. Albans, and living plants were sent home, one of which flowered in the collection of Sir Trevor Lawrence, Bart., at Burford, in March, 1905, when it was exhibited at a meeting of the Royal Horticultural Society, and received an Award of Merit. It is a very distinct species, best comparable, among cultivated ones, to *Coelogyne speciosa*, Lindl. (B.M. t. 4889), though readily distinguished by its longer scape, which, moreover, is borne at the apex of the mature pseudobulb, not from the centre of the young growths. The details of the lip and keels are also quite different. The plant here figured was presented to Kew by Messrs. Sander, and it has since been grown in a warm house.

The genus is widely diffused in India and the Malay Archipelago, and a good many species are in cultivation, varying considerably in habit and in the colour of the flowers. Among those figured in this work may be mentioned *C. pandurata*, Lindl. (t. 5084), a striking species

with green and black flowers; *C. Parishii*, Hook. f. (t. 5323), somewhat similar but much smaller; *C. Veitchii*, Rolfe (t. 7764), bearing drooping racemes of pure white flowers; *C. Massangeana*, Reichb. f. (t. 6979); *C. testacea*, Lindl. (t. 4785); *C. Schilleriana*, Reichb. f. (t. 5072); *C. Cumingii*, Lindl. (t. 4645); *C. corymbosa*, Lindl. (t. 6955); *C. elata*, Lindl. (t. 5001); *C. odoratissima*, Lindl. (t. 5462); *C. Rossiana*, Reichb. f. (t. 7176); *C. Swaniana*, Rolfe (t. 7602); *C. graminifolia*, Par. and Reichb. f. (t. 7006); and several others. The section *Pleione*, of which six species have also been figured, is now regarded as a distinct genus.

Descr.—An epiphytic herb, with stout rhizomes. *Pseudobulbs* ovoid-oblong, 2–3 in. long, 1–1¼ in. broad, 2-leaved. *Leaves* broadly lanceolate, acuminate, attenuate at the base, 8–11 in. long, about 1¼ in. broad. *Scape* arising from the apex of the matured pseudobulb, 7–8 in. long, 1-flowered. *Bracts* spathaceous, lanceolate, striate, 1¼–1½ in. long. *Pedicels* 1½ in. long. *Sepals* spreading, lanceolate-oblong, subacute, 2–2¾ in. long, ¾–1½ in. broad, keeled at the back, greenish yellow. *Petals* spreading, linear, acute, 2–2¾ in. long, under ¼ in. broad, yellow. *Lip* 3-lobed, 2–2½ in. long, obscurely saccate at the base; side-lobes erect, broadly oblong, obtuse, 1¼ in. long, bright brown; front lobe recurved, broadly ovate, obtuse or apiculate, slightly undulate, about 1¼ in. long, white, with a sulphur-coloured tint near the apex; disk marbled with bright brown, with three fimbriate keels extending to the base, where two additional smaller keels occur inside the lateral pair. *Column* clavate, incurved, about 1¼ in. long, winged near the apex.—R. A. Rolfe.

Fig. 1, column; 2, anther-cap; 3, whole plant:—1 *and* 2 *enlarged*; 3, *much reduced.*

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Tab. 8165.

OLDENLANDIA DOLICHANTHA.

East Tropical Africa.

RUBIACEAE. Tribe HEDYOTIDEAE.

OLDENLANDIA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 58.

Oldenlandia dolichantha, *Stapf in Journ. Linn. Soc.* vol. xxxvii. (1906), p. 518; affinis *O. rotatae*, Baker, a qua foliis multo latioribus et corolla multo majore ore villosa distincta.

Herba annua, erecta, ad 40 cm. alta, plerumque glabra; çaulis quadrangularis vel subalatus, ramis nonnullis ad vel ultra 15 cm. longis, aliis ad foliorum fasciculos reductis. *Folia* sessilia, e basi lata rotundata, lanceolata vel linearia et tunc interdum breviter petiolata, acuta, 2·5–6 cm. longa, 2–10 mm. lata, patula vel deflexa; stipulae ad commissuram brevem membranaceam parce fimbriatam redactae. *Flores* axillares, sessiles, solitarii, vel 2–3-nati. *Receptaculum* turbinatum, glabrum. *Calycis segmenta* 4, lineari-subulata, 7–8 mm. longa, maturitate haud aucta, aequalia. *Corolla* hypocrateriformis, alba; tubus tenuis, ad 10 cm. longus, vix 1 mm. diametro, sub limbo infundibuliformis et hic extus albo-papillosus, intus ore pilosus; lobi 4, lanceolati, acuminati, 9–10 mm. longi. *Antherae* sub ipso ore sessiles. *Ovarium* vertice conicum; stigma clavatum, vix 2-lobum, exsertum. *Capsula* ellipsoideo-ovoidea, 4-costata, apice dentibus 4 angustis dehiscens. *Semina* oblique ovoidea, laevissima, 0·6 mm. longa.

This species was discovered by Mr. M. T. Dawe, Officer in Charge of the Forestry and Scientific Department of the Uganda Protectorate, in the Nile Province, Uganda, in 1905. It claims attention chiefly on account of the pure milk-white corolla-limbs which are almost an inch across and rest on an unusually long and slender tube. On it and on *O. rotata* the writer established (l.c.) a new section (*Conostomium*) of *Oldenlandia*, and pointed out at the same time that a closer examination of *Oldenlandia* may probably result in the breaking up of that genus into several genera, one of which would be *Conostomium*. Since then his attention has been drawn to a new genus, *Pentanopsis*, described by Dr. Rendle in 1898 and placed next to *Pentas*. Specimens of *Pentanopsis* recently received at Kew from Somaliland leave no doubt as to the generic affinity of *Pentanopsis* and of *Oldenlandia*, section *Conostomium*; but at the same time they confirm the view that they must either be placed in *Oldenlandia* or next to it. So far the species figured here is the

only one of this group the fruits and seeds of which are known. For this reason and pending a general revision of *Oldenlandia* it is preferable to leave open the question of the status of *Pentanopsis* or *Conostomium*. The species of this genus, subgenus or section, range from the Upper Nile and Lake Rudolf to British Somaliland.

Descr.—An erect *annual*, generally glabrous, 1 foot high, with quadrangular or slightly winged stems, branches some long, some reduced to tufts of leaves. *Leaves* sessile, lanceolate from a broad rounded base, or shortly petioled and linear, 1 to 2 in. long, $\frac{1}{12}$ to almost $\frac{1}{2}$ in. wide; stipules reduced to a membranous slightly fimbriate commissure. *Flowers* sessile, axillary, solitary or in pairs or threes. *Receptacle* glabrous. *Calyx* of 4 linear-subulate segments, $\frac{1}{3}$ in. long. *Corolla* salver-shaped; tube about 4 in. long, extremely slender, widened and externally papillose near the mouth; limb almost an inch across, pure milk-white, of 4 lanceolate, acuminate lobes, villous at the mouth. *Anthers* sessile just below the mouth of the corolla. *Stigma* club-shaped, exserted. *Capsule* ellipsoid-ovoid, 4-ribbed, the conical top dehiscing with 4 narrow valves. *Seeds* numerous, obliquely ovoid, quite smooth, very small.—Otto Stapf.

Cultiv.—Although this plant as represented here does not appear to have any great claim to favour as a garden plant, it may prove as useful as many other plants of similar character which form masses of stems and flower freely. Mr. Dawe, who collected it in Uganda, has described it as an attractive white-flowered herb. At Kew, grown in a tropical house, it throve well and soon formed a plant 18 inches high, flowering freely in midsummer. The flowers are fragrant.—W. Watson.

Fig. 1, portion of stem, showing stipules and axillary sessile flowers (corollas cut off); 2, part of corolla, showing the throat and insertion of stamens; 3, stamen, from the back; 4, stigma:—*all enlarged.*

M.S. del. J.N. Fitch lith.

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Tab. 8166.

SHORTIA uniflora.

Japan.

Diapensiaceae. Tribe Galacineae.

Shortia, *Torr. et A. Gr.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 620.

Shortia uniflora, *Maxim. in Bull. Acad. Petersb.* vol. xvi. (1871), p. 225; *Mel. Biol.* vol. viii. p. 20, in nota; *Hindmarsh in Gard. Chron.* 1902, vol. xxxi. p. 337, f. 116; *Flora & Sylva,* 1905, vol. iii. p. 246, cum figura nigra; a *S. galacifolia,* Torr. et A. Gr., habitu prostrata, pedunculis brevioribus a basi arcuatis et floribus majoribus roseis recedit.

Fruticulus sempervirens, repens, omnino glaber, 8–15 cm. altus. *Folia* conferta, longe petiolata, rigida, cordato-orbicularia, saepius latiora quam longa, 2–3 cm lata vel interdum in exemplaribus silvestribus usque ad 8 cm. lata, crenato-dentata, crenis apiculatis, lucida, intra marginem zona rubra ornata; petioli graciles, 2·5 interdum ad 10 cm. longi. *Scapi* numerosi, semper uniflori, in exemplaribus cultis folia superantes, in exemplaribus silvestribus saepius quam folia breviores, basi incrassati, foliis paucis spathulatis 1–2 cm. longis et prophyllis 3 crassis lanceolatis acuminatissimis circiter 1 cm longis suffulti, superne prope calycem bracteolis 3 e basi lata cordata ovato-lanceolatis acutis 6–8 mm. longis instructi, saepius singula paullo inferiore addita. *Flores* rosei, 4–4·5 cm. diametro, subnutantes. *Calycis segmenta* crassa, fere libera, persistentia, valde imbricata, inaequalia, lanceolata vel ovata, vix acuta, interiora altius inserta. *Corolla* late campanulata; tubus brevis; limbi lobi 5, imbricati, leviter recurvi, ambitu rotundati, irregulariter dentati. *Stamina* 5, petalis alterna, inter se libera, tubo corollae usque ad apicem adnata, quam corollae lobi breviora; antherae breves, dorso filamento adnatae. *Staminodia* 5, squamiformia, incurva, ovarium velantia. *Ovarium* globosum, 3-loculare; stylus filiformis, stamina superans, stigmate obscure trilobo. *Ovula* in loculis numerosa, placentis angulo interiori affixis inserta. *Capsula* globosa, loculicide dehiscens, polysperma.—*Schizocodon uniflorus*, Maxim. Mel. Biol. vi. p. 274; **Honzo Zufu, vol. xvii. p. 27.**

The Diapensiaceae consist of about half-a-dozen genera and twice as many species of dwarf herbs and shrubs inhabiting the temperate and arctic regions of the northern hemisphere, but chiefly mountain pine-woods in temperate latitudes. They now only occur in widely separated areas, and some of them are very rare, which is suggestive of a former more general distribution. Most of the genera are or have been in cultivation, and are illustrated in this Magazine; but from some cause they are rare in gardens. *Pyxidanthera barbulata,* Michx (t. 4592), is a very small trailing plant, a native of the Pine Barrens of New Jersey.

November, 1907.

Diapensia lapponica, Linn. (t. 1108), is the only member of the order having a wide range: it resembles a *Draba*, and occurs in high latitudes in all three continents. The only other species of *Diapensia* is restricted to the Himalayan mountains. *Shortia galacifolia*, Torr. & Gr. (t. 7082), is an exceedingly rare plant, found only in North Carolina. *S. sinensis*, Hemsl. (*Hook. Ic. Pl.* t. 2624), is a recent discovery in Western China. *Schizocodon soldanelloides*, Sieb. & Zucc. (t. 7316), has elegantly fringed flowers and is a native of Japan. *S. ilicifolius*, Maxim., is a closely allied species from the same country, and the only other species, *S. rotundifolius*, Maxim., is recorded as endemic in the Yaeyama Archipelago, near Formosa. *Galax aphylla*, Linn. (t. 754), has leafless scapes a foot and a half high and numerous small racemose flowers. It is also confined to the mountains of eastern North America. Finally there is *Berneuxia thibetica*, Decne (*Bull. Soc. Bot. France*, 1873, vol. xx. p. 159) from Moupine, Szechuen, which differs from both *Shortia* and *Schizocodon* in having numerous small, almost capitate flowers, and in little else. Franchet reduces it (*Nouv. Arch.* 2me série, vol. x. p. 54, t. 13, B—"*Davidi*") to *Shortia*; but if we accept this reduction, *Schizocodon* must also be merged in *Shortia*, which, as thus constituted, would, it is true, present less range of variation than the genus *Primula* and many others.

Descr.—An evergreen, creeping, glabrous undershrub 3–6 in. high. *Leaves* stalked, rigid, orbicular-cordate, usually broader than long, usually about an inch broad, but sometimes as much as 3 in. across, crenate-dentate, teeth apiculate, shining, encircled by a red marginal band; stalks slender, 1–4 in. long. *Scapes* numerous, 1-flowered, in cultivated plants overtopping the leaves. *Flowers* pink, veined with white, $1\frac{1}{2}$–$1\frac{3}{4}$ in. across. *Sepals* 5, unequal, lanceolate. *Corolla* broadly campanulate; tube short; lobes 5, broad, rounded, irregularly toothed. *Stamens* 5, alternating with and shorter than the corolla-lobes. *Staminodes* or nectaries 5, scale-like, incurved and covering the ovary. *Ovary* 3-celled; style filiform, overtopping the stamens. *Capsule* globose, splitting into 3 valves. *Seeds* numerous, small, globose.—W. Botting Hemsley.

Cultiv.—*Shortia uniflora* is as interesting as *S. galacifolia* and is quite as beautiful. It is said to be rare in Japan, and

until recently it had scarcely been known in English gardens, notwithstanding the desire of many to possess it. The Kew examples were purchased from a firm of nurserymen in Yokohama and flowered freely last April in an unheated frame, where they were grown to preserve their flowers from spring frosts, although the plant itself is quite hardy. It likes a moist peaty soil and a fairly open position where it can get some sunshine. The leaves of this species, like those of *S. galacifolia*, assume a rich crimson colour in autumn and winter.—W. Watson.

Fig. 1, base of scape with small leaves and scales; 2, pistil and part of the bracteoles and sepals; 3, part of corolla showing attachment of stamens and basal scales; 4, stigma; 5 and 6, stamens:—*all more or less enlarged.*

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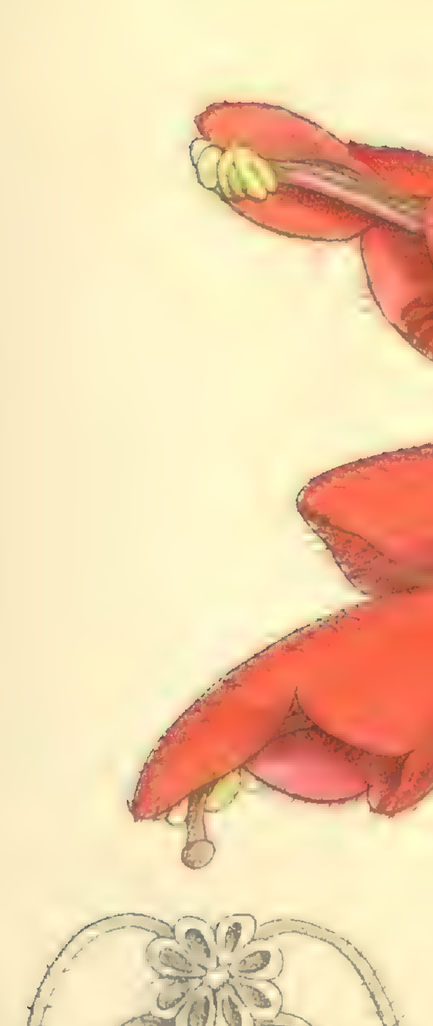

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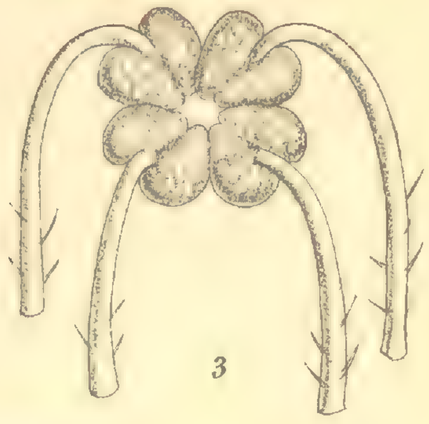

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Tab. 8167.

GESNERA cardinalis.

Brazil.

GESNERACEAE. Tribe GESNEREAE.

GESNERA, *Mart.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1003.

Gesnera cardinalis, *Lehm. in E. Otto, Garten- und Blumenzeitung, Hamburg,* vol. vi. (1850), p. 454; *Hanst. in Mart. Fl. Bras.* vol. viii. pars i. p. 373; species corolla laete coccinea, labio postico oblongo et calycis lobis erectis insignis.

Herba 20–25 cm. alta, asperule velutina, tubero depresso-globoso, caule sat debili. *Folia* late ovata, basi cordata, 10–15 cm. longa, 8 12 cm. lata, crenata, inferiora longiuscule petiolata, superiora minora, subsessilia, suprema approximata, ad bracteas redacta. *Flores* in axillis superioribus 1–4 aggregati, pedunculis longiores. *Calyx* dense velutinus; lobi erecti, triangulari-lanceolati, circiter 8 mm. longi, corollae strictura supra-basalem superantes, apice leviter recurvi, praesertim post anthesin. *Corolla* tubulosa, circiter 6–7 cm. longa, antice late bisulcata, lineamento antico subrecto, postico leviter curvato; labium posticum oblongum, lobis subtruncatis; anticum manifeste trilobatum, lobis ascendentibus vel patulis. *Filamenta* hirsuta. *Disci glandulae* 2 posticae tantum evolutae, rotundatae vel subtruncatae, 1·5 mm. longae, ima basi 2 mm. latae. *Placentae* undique ovuliferae, in sectione fere semicirculares facie interna leviter concava.—*G. macrantha*, Hort. ex Lehm. l.c., non Spreng. *Dircaea cardinalis*, Regel, Gartenfl. vol. ii. (1853), p. 35, t. 41. *Corytholoma cardinale*, Fritsch in Engl. et Prantl, Pflanzenfam. vol. iv. pars 3 b, p. 181.

Gesnera cardinalis belongs to a natural group of species for which Decaisne proposed the genus *Dircaea*. The most striking characteristic of the group is the great disproportion between the upper and lower lips of the corolla. The upper lip is very large and is bent over in bud so as to form a lid which completely covers the mouth of the corolla; as the flower expands the lip rises, turning through considerably more than a right angle and finally assuming an erect position. The lower lip is comparatively small.

The remarkable mode of union of the anthers in a disk, shown in figures 2 and 3, is characteristic of *Gesnera*; many other genera of Gesneraceae, however, have more or less connate anthers.

A number of the plants cultivated at Kew as *G. cardinalis*, including the one here figured, agree exactly with the figure in *Gartenflora* and with Hanstein's detailed

description in the *Flora Brasiliensis*, but another batch of them, while possessing exactly the habit of *cardinalis*, differs in the calyx, corolla and disk, and is undoubtedly of garden origin. The extreme form observed had *inflexed* calyx-lobes, *retuse* glands of the disk, and corolla-lips of very different shape from typical *G. cardinalis*, the lower lip consisting of a narrow, slightly reflexed rim, showing no obvious lobing, and the upper being ovate, with a slight constriction two-thirds of the way up.

Descr.—A velvety herb, about 9 in. high. *Stem* rather weak, springing from a slightly flattened, nearly globose tuber. *Leaves* broadly ovate, cordate at the base, 4–6 in. long, 3–5 in. broad, crenate, the lower ones long-petioled, the upper sessile and gradually decreasing in size. *Flowers* 1–4 together in each of the upper axils, often crowded together near the apex of the stem owing to the suppression of the uppermost internodes. *Calyx-lobes* erect, recurved at the apex. *Corolla* $2\frac{1}{2}$–3 in. long; tube with two grooves in front, running up to the point of union of the median and lateral lobes; upper lip oblong; lower lip distinctly 3-lobed, lobes ascending or spreading. *Filaments* hairy. *Glands* of the disk 2, posticous, rounded or nearly truncate.—T. A. Sprague.

Cultiv.—*Gesnera cardinalis* is a popular stove plant comparatively easy of cultivation. It is undoubtedly the best of the Gesneras from the decorative standpoint, and is distinguished from all the species in cultivation by its habit, and by the pose and colour of its flowers. The rootstock is a stout tuber, and from this there spring annually herbaceous stems, rarely more than a foot high, which mature and flower within six months of starting. In this respect the plant resembles the Sinningias (Gloxinias) and in fact the treatment that suits the one suits the other. By a little management in resting and starting the tubers it is possible to have this Gesnera in flower either in winter or summer.—W. Watson.

Fig. 1, section through calyx, showing pistil and glands; 2, stamens and part of corolla, showing attachment; 3, anthers, seen from above; 4, stigma:—*all enlarged.*

M.S. del, J.N. Fitch lith.

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Tab. 8168.

PRIMULA muscarioides.

Western China.

Primulaceae. Tribe Primuleae.

Primula, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 631.

Primula (§ Soldanelloideae) **muscarioides**, *Hemsl. in Kew Bull.* 1907, p. 319; ex affinitate *P. cernuae*, Franch., et *P. deflexae*, Duthie, ab illa foliis distincte crenatis, ab hac foliis majoribus crenatis, calyce efarinoso et corollae lobis vix emarginatis differt.

Folia rosulata, subcarnosa, laete viridia, obovato-spathulata, 10–12 cm. longa, apice rotundata, deorsum attenuata sed non vere petiolata, crenato-dentata, ciliolata, supra pilis mollibus obscuris parce vestita, subtus glabra vel cito glabrescentia, inter venas primarias leviter bullata, costa carnosa crassa. *Scapi* erecti, quam folia fere duplo longiores. *Bracteolae* lineares, calyce breviores. *Flores* numerosi, densissime capitato-spicati, deflexi; spicae 2·5–3·5 cm. longae. *Calyx* campanulatus; lobi erecti, inaequales, ovato-oblongi, posteriore latiore 2- vel 3-dentato florum superiorum atropurpureo. *Corolla* anguste infundibularis, vix 1 cm. longa, saturate purpureo-coerulea vel fere violacea; lobi quam tubus cylindricus dimidio breviores, subtruncati, suberecti, obscure emarginati, circiter 3 mm. lati. *Antherae* subsessiles, tubo infra medium affixae. *Stylus* tubum paullo excedens. *Capsula* ignota.

At first sight this striking *Primula* was taken for *P. deflexa*, Duthie, which, however, has fewer and larger flowers, with the limb of the corolla broader and cup-shaped, while the lobes are broader and distinctly notched. As stated in the *Kew Bulletin*, *P. cernua*, Franchet, *P. pinnatifolia*, Franchet, *P. deflexa*, Duthie, and the present species are very closely allied and perhaps not all deserving of specific rank, but with the material we have before us it is preferable to keep them separate. Wilson's dried specimen, n. 4036, is quite similar in aspect, but the leaves are much more hairy and the calyx is mealy. *P. muscarioides* has, so far as the Kew material goes, almost sessile anthers near the base of the corolla tube, and the stigma projects slightly from the mouth of the tube. *P. cernua*, in the only specimen examined, has the anthers attached near the top of the tube and the style is only about $\frac{1}{25}$ of an inch long. In Wilson's 4036, which has been referred to *P. deflexa*, the anthers are attached a little above the middle of the corolla-tube and

are overtopped by the slightly exserted style. Thus there is trimorphism of the genitalia in this very distinct group of *Primula*. *P. deflexa* is apparently a taller plant, both under wild and garden conditions, some of the Kew examples having scapes two feet and leaves one foot long.

Our drawing of *P. muscarioides* was made from specimens received from the "Bees, Limited," Neston, Cheshire, in May of the present year, and Mr. G. Forrest, who collected for Mr. A. K. Bulley, has kindly communicated the following particulars of the habitat :—"The seed of this species was collected in Yunnan, in December, 1894, on the summit of Mao Niu Chang (Wild Yak Pass), situated on the dividing range between the Yangtze Valley and Chung Tien Plateau, at 14,000 to 15,000 feet, in lat. 27° 40′ to 28°. It inhabits moist, open, grassy situations, on the margins of pine forests."

Descr.—Leaves rosulate, rather fleshy, light green, obovate-spathulate, 4 to 5 in. long, rounded at the tip, gradually tapering downwards, but not distinctly stalked, crenate, obscurely fringed, sparsely clothed with soft hairs on the upper surface, glabrous or soon glabrescent below, bulging between the primary veins; midrib thick, fleshy. *Scapes* erect, about twice as long as the leaves. *Bracteoles* linear, shorter than the calyx. *Flowers* numerous, densely capitate, turned downwards; spikes 1–1$\frac{3}{4}$ in. long. *Calyx* campanulate, of the upper flowers purple; lobes erect, ovate-oblong, unequal, the upper one broader, 2- or 3-toothed. *Corolla-tube* narrow, less than $\frac{1}{2}$ in. long, deep purple-blue or almost violet; lobes slightly spreading, truncate, obscurely notched, $\frac{1}{6}$—$\frac{1}{5}$ in. across. *Anthers* sessile near the bottom of the corolla-tube. *Style* scarcely exceeding the tube. *Capsule* not seen.—W. Botting Hemsley.

Fig. 1, a bracteole; 2, calyx, laid open, and pistil; 3, section of corolla:—*all enlarged.*

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Tab. 8169.

PICEA morindoides.

Eastern Himalaya.

Coniferae. Tribe Abietineae.

Picea, *Link*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 439.

Picea morindoides, *Rehder in Sargent, Trees and Shrubs* (1903), p. 95, t. 46; *Henry in Gard. Chron.* 1906, vol. xxxix. pp. 132, 219; *Masters, l.c.* p. 213, fig. 34 et p. 274, fig. 113 et 1907, vol. xli. p. 388; ex affinitate *P. ajanensis*, Fisch. ex Trautv., sed habitu multo graciliore, conisque multo majoribus foliorumque anatomia distincta.

Arbor coma conica regulari, ramis verticillatis patulis, ramulis glabris gracilibus pendulis nisi apicem versus magis minusve patentibus, junioribus flavescentibus tertio anno cinerascentibus, pulvinis e basi ima lata abrupte contractis subcylindricis 1 mm. longis cicatrice terminali rhomboidali haud obliqua lateribus concavis. *Gemmae foliorum* ellipsoideae vel obovoideae, obtusae, 5–6 mm. longae, pallidae, paulo resinosae, squamis tenuiter scariosis obovatis obtusissimis. *Folia* acicularia, gracilia, apice spinulosa, pungentia, 2·5–3·5 cm. longa, 0·7–1·2 mm. lata, a dorso complanata, sectione transversa rhomboideo-elliptica, marginibus costisque obtusis, dorso viridia, facie lineis duabus albo-glaucis; stomata in facie secundum costam utrinque 4–6-seriata; ductus resiniferi duo dorsales, haud procul a margine siti, hypodermati appositi, fibris sclerenchymaticis tunicati, interdum breves vel nulli; hypoderma sclerenchymaticum supra subtusque ad costam strato duplice. *Strobili masculi* rosei, elongato-ellipsoidei, ad 2 cm. longi, 8–9 mm. lati, basi squamis eis gemmarum foliorum simillimis suffulti; connectivi appendix orbicularis, circumcirca lacerato-denticulatus. *Strobili feminei* laterales (an semper?), oblongo-ellipsoidei, ad 2 cm. longi, 1 cm. diametro, purpurei, basi ut masculi squamis suffulti; carpella e basi lata ovata cuspidato-acuminata, 1·5 mm. longa, obscure denticulata; squamae ovuliferae ovato-rotundatae, subdenticulatae, sub anthesi carpello duplo longiores. *Coni maturi* oblongo-cylindrici, obtusi, 6–9 cm. longi, 3 cm. diametro, badii, vix nitiduli; squamae basi magis minusve in unguem obtriangularem vel obovatum contractum, supra unguem late ovatae, obtusae, apicem versus obscure striatae, inferiores majores ad 20 mm. longae (ungue incluso), 10–14 mm. latae. *Semen* ambitu obtriangulare, 2–5 mm. longum, testa alutacea, ala oblique obovato-oblonga, tenuissima, 6–12 mm. longa.

Picea morindoides was described in 1903 from specimens of unknown origin in cultivation in Mr. Allard's arboretum at Angers in France. Subsequently, a tree growing in the Earl of Annesley's park at Castlewellan, Co. Down, was recognised by Dr. A. Henry as identical with it. This tree was raised from seed received by the Earl of Annesley from Chumbi in 1889. Another specimen of unknown origin

occurs in Sir Edward Loder's garden at Horsham, Sussex, where *Picea morindoides* has produced cones for the first time in this country.

Dr. A. Henry identified *Picea morindoides* with the spruce collected by Sir Joseph Hooker in the Lachen Valley in Sikkim, which is referred to in the *Himalayan Journal* (vol. ii. p. 32) as *Abies Smithiana*; also with a spruce collected in Chumbi by Sir J. Ware Edgar, who was then (in 1877) accompanied by Sir George King's collector, Dungboo,—obtained again by Mr. H. E. Hobson, when stationed at Yatung, and by Mr. E. H. C. Walsh during the Tibet Exhibition. To these specimens another collected by Dungboo in Chumbi in 1878 and one obtained by Mr. R. Pantling in Sikkim (Herb. C. B. Clarke 46482) might be added, and it is also evident that Gammie's *Picea Morinda* from the Lachung Valley (*Rec. Bot. Surv. Ind.* vol. i. No. ii. pp. 11, 19) is the same tree. In my opinion, there can be little doubt that Dr. Henry is right in his identification of those specimens with Rehder's *P. morindoides*, although this implies the admission of a considerable range of variation in the shape of the leaf-points, the density of the foliage, the shape of the cone-scales, and to some degree also in the more minute details of the leaf anatomy. I have not accounted for this variability in the description above, which is drawn up from the cultivated tree, but do not consider it greater than that observable in the common European spruce. Dr. Henry, however, has gone one step farther and includes Griffith's *Abies spinulosa* (*Journ.* pp. 259, 265; *Itin. Not.* p. 145, No. 694, and *Ic. Pl. Asiat.* t. 363) in *Picea morindoides*, which, if proved, would entail the change of the latter name into *Picea spinulosa*. Unfortunately there are no specimens of Griffith's tree at Kew or at the British Museum, and it is very doubtful if there be any now in existence. I have therefore retained for the present Rehder's name; but I must admit that there is much to be said in favour of Dr. Henry's view. Griffith's description, so far as it goes, agrees well with *Picea morindoides*, and his figure tallies strikingly with a sketch of the Lachen spruce made by Sir Joseph Hooker. He collected "*Abies spinulosa*" on the slopes of the Rodoola Pass and the Tung-chiew Valley in Northern Bhootan (about 91° 30′ E. long., and almost 150 miles east of the Sikkim frontier), and describes it as a

beautiful tree, disposed in beautiful groups and growing between 9,000 and 10,500 feet, which agrees fairly well with the limits of the spruce of the Lachen Valley in Sikkim.

Picea morindoides belongs to the section Omorica which is chiefly developed in the countries bordering on the Northern Pacific, but, in the Old World, extends in discontinuous areas as far as the Balkan Peninsula, where it is represented by *P. Omorica*, Panč. It is the only member of the section known from the Himalaya. The nearest species, a link between it and *P. ajanensis*, appears to be *P. complanata*, Mast., from Szechuen. As I know it only from Dr. Masters' description and figures in the *Gardeners' Chronicle* (3rd ser. vol. xxxix. p. 146, fig. 57), I have refrained from referring to it in the diagnosis; but the resemblance seems to be very great indeed. *P. complanata* was discovered by Mr. E. H. Wilson in Western Szechuen, where it forms forests at an elevation from 5,000 to 8,000 feet.

To judge from the photograph of the Earl of Annesley's tree which is reproduced in the *Gardeners' Chronicle* for May 5th, 1906, *Picea morindoides* will certainly be a valuable addition to our hardy trees.

Descr.—A *tree* of regular conical growth with spreading whorled branches; branchlets glabrous, slender, pendulous or the upper spreading, yellowish when young, turning grey after the third year; leaf-cushions abruptly subcylindric from a broad base, with a terminal rhomboid scar and concave sides. *Leaf-buds* ellipsoid or obovoid, obtuse, $\frac{1}{4}$ in. long, pale brown, slightly resinous; scales obovate, very obtuse, thinly scarious. *Leaves* needle-shaped, slender with fine sharp points, 1–1$\frac{1}{3}$ in. long, $\frac{1}{35}$–$\frac{1}{20}$ in. broad, dorsally compressed, rhomboid-elliptic in transverse section, with obtuse edges and midrib, green on the back, with two whitish-glaucous lines on the (morphologically) upper side, the lateral always turned by a twist of the leaf-cushions, so as to expose the green side to the light maximum; stomata on the glaucous side in 4–6 rows on each side of the midrib; resin canals 2, dorsal, near the edges and close to the sclerenchymatic hypoderma, sometimes very short or absent. *Male strobili* rose-coloured, elongate-ellipsoid, up to $\frac{3}{4}$ in. long, $\frac{1}{3}$ in. in diameter, with scales at the base resembling those of the leaf-buds; connective with an orbicular, irregu-

larly denticulate appendix. *Female strobili* lateral (always ?), oblong-ellipsoid, up to $\frac{3}{4}$ in. long, $\frac{5}{12}$ in. in diameter, purple, scales at the base as in the male strobili; carpels (bracts of older authors) wide-ovate, cuspidate-acuminate, $\frac{1}{16}$ in. long, obscurely denticulate, ovule-bearing scales ovate-rotundate, subdenticulate, twice as long as the carpel (in flower). *Cones* oblong-cylindric, obtuse, 2–3$\frac{1}{2}$ in. long, over 1 in. in diameter, light brown, very slightly shining; scales contracted at the base, claw obovate or inversely triangular, wide-ovate above the claw, obtuse, indistinctly striate towards the apex, the lower (larger) up to $\frac{5}{6}$ in. long, about $\frac{1}{2}$ in. broad. *Seed* obovoid or broadly cuneate, $\frac{1}{12}$–$\frac{5}{12}$ in. long, testa pale; wing obliquely obovate-oblong, $\frac{1}{4}$–$\frac{1}{12}$ in. long, very thin (the maxima according to Rehder).—Otto Stapf.

Fig. 1, leaf; 2 and 3, stamens; 4, carpel and ovuliferous scale from flower; 5, carpel and scale from fruit; 6, carpel; 7, fruit-scale, seen from within; 8, seed:—*all enlarged.*

Vincent Brooks, Day & Son Lith.

L. Reeve & Co. London.

Tab. 8170.

DELPHINIUM candidum.

Tropical Africa.

Ranunculaceae. Tribe Helleboreae.

Delphinium, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 9.

Delphinium (Macrocentra) candidum, *Hemsl.*; species ex affinitate *D. macrocentri*, D. Oliv. (B. M. t. 8151), a quo differt racemis subtrifloris, floribus albis, sepalis omnibus aequaliter divergentibus, calcare gracili curvato et filamentis ciliatis.

Herba perennis, nana, obscure puberula, caulibus subtrifloris. *Folia radicalia* longe petiolata, ambitu orbicularia, palmatim alte 5-lobata, lobis latis 3-lobulatis dentatisque, circiter 10–12 cm. diametro; petioli teretes, basi tantum leviter dilatati, 20–36 cm. longi. *Folia caulina* pauca, similia, profundius partita, lobis angustioribus. *Flores* candidi, antheris purpureis, suaveolentes, circiter 6 cm. diametro, obscurissime puberuli; pedicelli pubescentes, graciles, 3–4 cm. longi, bracteolis 2 linearibus 5–7 mm. longis instructi. *Sepala* fere aequalia, orbiculari-ovata, 2–2·5 cm. lata, patentia, superius et 2 inferiora abrupte obtuseque acuminata, omnia pilis longis albis obscuris parce vestita et extus prope apicem macula viridi incrassata ornata; calcar gracile, bis curvatum, acutum, rugulosum, 4–5 cm. longum. *Petalorum* 2 superiorum calcaratorum (nectaria auctorum nonnullorum) limbus glaber, obliquus, dolabriformis, inaequaliter bifidus, 1·5 cm. longus, 8 mm. latus, stamina superans. *Petala* 2 lateralia (staminodia auctorum nonnullorum) puberula, ligulata, apice latiora, 3-dentata, quam stamina breviora. *Staminodia vera* (?) 3, linearia, antica, quam stamina breviora (an semper adsunt?). *Stamina* numerosissima; filamenta membranacea, ciliata, diverse dilatata, exteriora latiora, interdum unilateraliter dilatata et apice 1-dentata, interiora fere omnino filiformia. *Carpella* (matura non visa) 3, dense tomentosa, quam stamina breviora.

Delphinium candidum belongs to a small group of species confined, so far as is at present known, to the mountains of tropical East Africa. It is compared above with *D. macrocentron*, D. Oliv., because that species is in cultivation; but it is more nearly allied to *D. Leroyi*, Franch. (*Engl. Jahrb.* vol. xx. p. 474) and *D. Wellbyi*, Hemsl. (*Kew Bull.* 1907, p. 360). The former differs in having more hairy flowers, obovate-spathulate sepals and glabrous filaments; the latter is a more robust plant with very hairy, blue flowers, rounded, not acuminate, sepals, entire lateral petals and less dilated filaments.

The plant figured was raised in the gardens at Hindlip Hall, Worcester, from seed collected by Lady Hindlip, in

1904, one day's march from Mumias, between Mount Elgon and Kisumu, Uganda. Only one plant flowered, we believe, and our drawing has been made from leaves and flowers, and from a painting and a photograph furnished by Lady Hindlip. It is a very beautiful species, and it is to be hoped that it has been permanently secured to cultivation.

There is a monograph of the genus *Delphinium* by Dr. E. Huth in *Engl. Jahrb.* vol. xx. (1895), pp. 322–499, tt. 6–8, in which the author describes 198 species.

Descr.—A dwarf, slightly hairy perennial; branches usually 3-flowered. *Leaves* palmately 5-lobed, largest 4 to 5 in. across; lobes broad, usually 3-lobulate and toothed, smaller and narrower upwards; stalks of the lower ones 8–15 in. long. *Flowers* sweet-scented like the primrose, pure white with purple anthers, about $2\frac{1}{2}$ in. across, obscurely hairy. *Stalks* slender, pubescent, $1\frac{1}{4}$–$1\frac{3}{4}$ in. long; bracteoles usually 2, linear, about $\frac{1}{4}$ in. long. *Sepals* almost equal, orbicular-ovate, $\frac{3}{4}$–1 in. across, each having a thickened, green spot near the top on the underside. *Spur* slender, curved upwards and recurved at the tip, $1\frac{1}{2}$–2 in. long. *Limb* of the upper spurred petals glabrous, oblique, unequally notched, $\frac{1}{2}$–$\frac{3}{4}$ in. long, overtopping the stamens. *Lateral petals* slightly hairy, ligulate, 3-toothed, shorter than the stamens. *Filaments* variously flattened, sometimes on one side only with a tooth at the top, fringed, outermost broadest, innermost nearly filiform. *Carpels* three, densely hairy, shorter than the stamens. *Seed* not seen.—W. Botting Hemsley.

Fig. 1, one of the upper petals or nectaries; 2, androecium and lower petals; 3 and 4, stamens; 5, carpels:—*all enlarged.*

1

2

3

4

5

M.S. del. J.N. Fitch lith.

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Tab. 8171.

ERIA longispica.

Borneo.

Orchidaceae. Tribe Epidendreae.

Eria, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 509; *Hook. f. Fl. Brit. Ind.* vol. v. p. 785.

Eria longispica, *Rolfe*; species *E. latifoliae*, Reichb. f., affinis sed floribus majoribus, labello circumscriptione orbiculari, nec obovato differt.

Herba epiphytica, epseudobulbifera. *Caules* erecti, robusti, circa 15 cm. alti, 6-8-phylli. *Folia* disticha, coriacea, ligulato-oblonga, apice obliqua, inaequaliter biloba et acuta, 30–40 cm. longa, 3–4·5 cm. lata. *Racemi* terminales, graciles, valde elongati, albido-pubescentes, 25–40 cm. longi, densiflori. *Bracteae* reflexae, ovatae, acutae vel acuminatae, 2 mm. longae. *Pedicelli* graciles, 7–8 mm. longi, tomentosi. *Sepalum* posticum elliptico-oblongum, obtusum, 5 mm. longum; sepala lateralia oblique ovata, obtusa, 5 mm. longa, 4 mm lata, reflexa. *Petala* lineari-oblonga, obtusa, 4 mm. longa. *Labellum* trilobum, orbiculare, 5 mm. longum, 5 mm. latum; lobi laterales lati, subobtusi; lobus intermedius parvus, quadratus, obtuse bilobus, interdum denticulatus; discus tricarinatus, carinis lateralibus oblongis glabris, carina media farinacea, apice in cristam orbicularem expansa. *Columna* brevissima, alis brevibus truncatis.

The species of *Eria* are difficult to discriminate, because so many of them are only known from dried specimens, and the crests and other details of the lip are not readily restored by maceration after they have been dried. The present species has for some years been in cultivation at Kew, though not under its present name, a plant having been presented to the establishment by Messrs. Linden, of Brussels, in 1898. It had, however, been previously submitted for determination by them in September, 1893, with the record that it had been imported from Borneo. It belongs to the section *Eriura* as defined by Lindley (*Journ. Linn. Soc.* vol. iii. p. 55), and is most nearly allied to a species originally described by Blume as *Mycaranthes latifolia* (*Bijdr.* p. 353). When Blume's genus *Mycaranthes* was reduced by Lindley to a section of *Eria* he excluded *M. latifolia* as belonging to *Eriura* though, since it is the only species figured, it might have been considered typical of the section *Mycaranthes*,

especially as Lindley admitted that he did not know the other two species. It is perhaps for this reason that J. J. Smith retains Blume's generic name for the section (*Orch. Jav.* p. 391).

Eria longispica is very nearly allied to *E. latifolia*, Reichb. f., though it is distinct in the characters indicated. It is an exceptionally sturdy plant, with erect habit, broad leaves, and long spikes of very numerous flowers, which are light-yellow blotched with reddish purple. The lateral keels of the lip are yellow, but the central one is covered with a loose powdery pubescence, which is removable with the slightest touch. *E. paniculata*, Lindl., belonging to the same section, which is also in cultivation, has a pendulous habit, and very narrow leaves.

Descr.—A stout epiphytic herb, without pseudobulbs. *Stems* erect, stout, about six inches high, with six to eight leaves. *Leaves* distichous, coriaceous, ligulate-oblong, with the apex obliquely 2-lobed and acute, 12–16 in. long, $1\frac{1}{4}$–$1\frac{3}{4}$ in. broad. *Racemes* terminal, slender, clothed with a whitish pubescence, 10–16 in. long, densely many-flowered. *Bracts* reflexed, ovate, acute or acuminate, $\frac{1}{12}$ in. long. *Pedicels* slender, about $\frac{2}{3}$ in. long, densely white-tomentose. *Dorsal sepal* elliptical-oblong, obtuse, $\frac{1}{5}$ in. long; *lateral sepals* obliquely ovate, obtuse, $\frac{1}{5}$ in. long by nearly as broad, reflexed. *Petals* linear-oblong, obtuse, $\frac{1}{6}$ in. long. *Lip* 3-lobed, orbicular in outline, $\frac{1}{5}$ in. long; side lobes broad, subobtuse; front lobe small, quadrate, obtusely 2-lobed or sometimes denticulate in front; disk 3-carinate, with the central keels oblong and glabrous, and the central one narrowed behind, expanded into a rounded crest in front, and covered with a loose, farinaceous pubescence. *Column* short, with broad truncate wings.—R. A. Rolfe.

Cultiv.—*Eria longispica* has been in cultivation at Kew since 1898. It is a plant of exceptionally free growth, with Iris-like habit, and it produces its tall not unattractive flower spikes in May in a tropical house where the conditions are those suitable for Cypripediums. Very few of the numerous species of *Eria* can be included among popular garden orchids, five only having been previously figured in this work, none of them being of striking merit from the cultural standpoint, although *E. extinctoria* and *E. vestita* are two distinct and pleasing

orchids. *E. longispica* thrives in a mixture of peat and sphagnum, kept moist at all times except for about eight weeks in midwinter, when the plant should be allowed to rest.—W. Watson.

Fig. 1, flower; 2, white papillae from centre of lip; 3, column; 4, anther cap; 5, pollinia:—*all enlarged.*

SUPPLEMENTARY NOTE.

Tab. 8163. *Rhododendron intricatum.* The plant figured was raised from seed collected by Mr. E. H. Wilson, in Szechuen, at elevations between 11,000 and 15,000 ft. above sea-level. Among his herbarium specimens, those numbered 3934, in flower, belong to this species. These specimens were collected in June, 1904; they are not precisely localised, but it is noted that they were found inhabiting grassland.

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